
LibraryXpress™ Series

DLT Library Base Module

Models: LXB4X10 and LXB7X10

***Installation
and
User Manual***

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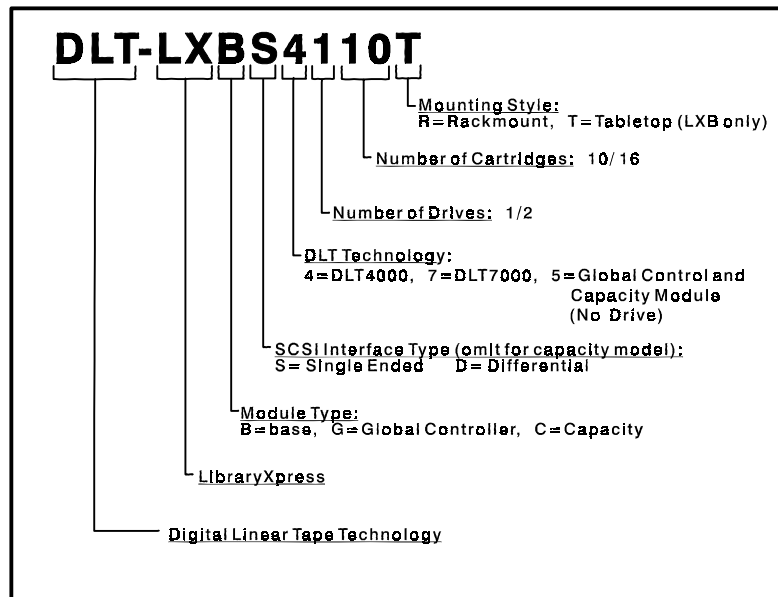
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Chapter 1 - Introduction

The DLT LibraryXpress™ Base Module is the foundation of an expandable, modular tape library system. The LibraryXpress system is designed for high duty-cycle on-line and near-on-line applications such as hierarchical storage management (HSM). It is a superior performer in high-volume backup and archival service as well.

Models

The complete model number for any of the LibraryXpress modules follows the pattern shown below:



For the sake of brevity, the different tape drives in LXB modules are referenced in the manual according to this example: **LXB7110**

Chapter 1 - Introduction

The Base Module contains one or two DLT drives plus a 10-cartridge magazine with a rugged random access loader mechanism. The DLT LibraryXpress Base Module is available in four models:

- LXB4110
- LXB4210
- LXB7110
- LXB7210.

All models use the high-density DLTtape IV cartridges. DLTtape IV media is rated at over 1,000,000 head passes. All models can also read and write DLTtape III and DLTtape III XT cartridges. Write densities are selectable from the front panel, and under SCSI control from the host.

SCSI Interface Configuration

The DLT LibraryXpress Base Module may be ordered with a choice of single-ended or differential SCSI-2 interfaces. The LXB4X10, SCSI-2 interface, uses two female, high-density 50-pin D-series connectors per bus. The LXB7X10, Fast/Wide SCSI Interface uses high-density 68-pin connectors. The section on *Interfaces* in *Chapter 2 - Installation* describes the available interface options.

Data Transfer Rates

Table 1-1 Data Transfer Rates

Drive Technology	Number of Drives	Maximum Sustained Native Rate MB/second	Maximum Sustained Native Rate GB/hour
DLT 4000	1 (LXB4110)	1.5	5.4
DLT 4000	2 (LXB4210)	3.0	10.8
DLT 7000	1 (LXB7110)	5.0	18
DLT 7000	2 (LXB7210)	10	36

Note: The rates for compressed data are the native rates multiplied by the compression factor, which depends on file content, but averages approximately 2:1.

Note: GB/hour rates are maximum and may vary due to the specific characteristics of the data.

The SCSI interface for the library robotics is designed for high-speed operation, in anticipation of improvements in drive technology. As faster drives become available, they will be made available for upgrade of the Base Module.

Internal Cabling

All models are shipped with separate external SCSI connections for the library robotics and each of the drives. These configurations are described in more detail in the section on Interfaces in *Chapter 2 - Installation*.

Physical Configuration

All models of the Base Module may be ordered in either rack mount or desktop configuration. For users who start with a desktop configuration and later wish to expand, a conversion kit is available to convert a desktop module to rack mount configuration. Another kit is available for conversion in the opposite direction. See *Appendix B - Accessories/ Spares/FRUs* for the part numbers.

System Expansion

A LibraryXpress Base Module may be expanded in capacity or performance or both by adding a Global Control Module and one or more additional LibraryXpress modules in a rack mount configuration. Overland Data's Smartscale Storage™ architecture enables the robotics in each of the LibraryXpress modules to exchange cartridges by means of the XpressChannel™ pass-through cartridge elevator, and integrates the robotics in the individual modules and the Global Control's XpressChannel into a single high-performance library robotics system.

Contact your Overland Data representative for more information about expanded LibraryXpress systems.

Features

Figures 1-1, 1-2, and 1-3 identify some of the external features of the LXB4X10 and LXB7X10 Base Modules.

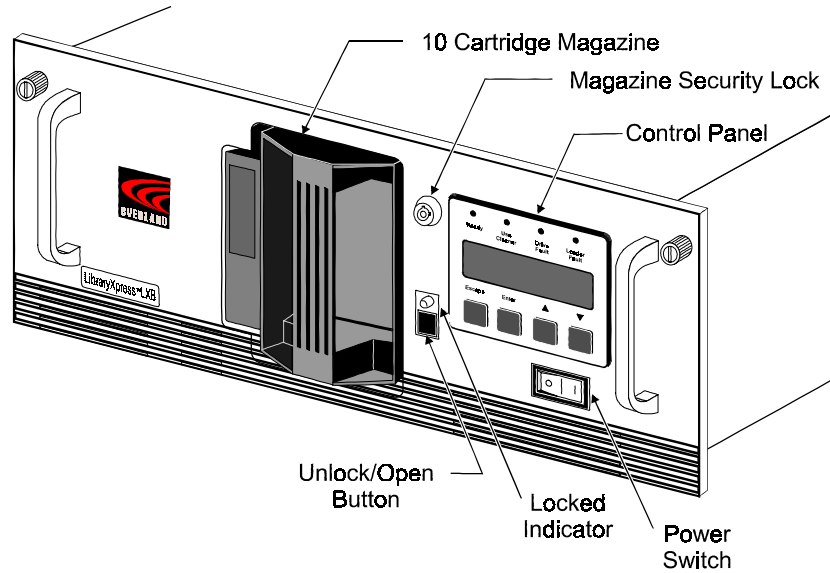


Figure 1-1 Front View

Control Panel

The control panel features a 4-line by 20-character backlit LCD display, four LED indicators and four buttons. The buttons enable the operator to navigate through the menu structure to select and display operating modes, device status, diagnostic and maintenance functions, device history and error statistics, and system configuration. The functions of the control panel are described in detail in *Chapter 3 - Operation*.

Chapter 1 - Introduction

Display

The backlit 4-line by 20-character control panel display provides a highly intelligible display of drive and loader status, menu choices and error messages. The scrolling feature greatly expands the amount of information available to the operator.

Power Supply

The AC Power switch is located on the front panel of the module. The autoranging power supply will adjust automatically to either of two operating voltage ranges. The ranges are 104-120 VAC and 200-254 VAC. The power supply is capable of operating at 50 or 60 Hz without requiring any modification. AC power is supplied to the power supply by a single cable which can be plugged into any properly grounded outlet.

Tape Cartridge Magazine

The ten-cartridge magazine is removable from the front panel, but is protected from tampering by a key-operated Magazine Security Lock which must be unlocked before the magazine can be removed. The rugged polymer magazine fits into an extruded track, which assures precise positioning with respect to the library robotics. A tape magazine is shown in Figure 1-2. Insertion and removal of the magazine is described in *Chapter 3 - Operation*.

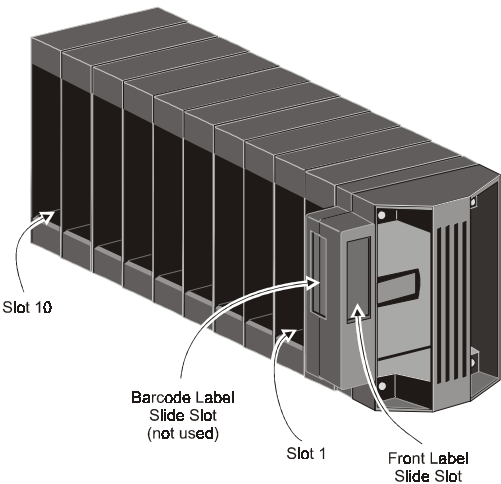


Figure 1-2 Cartridge Magazine

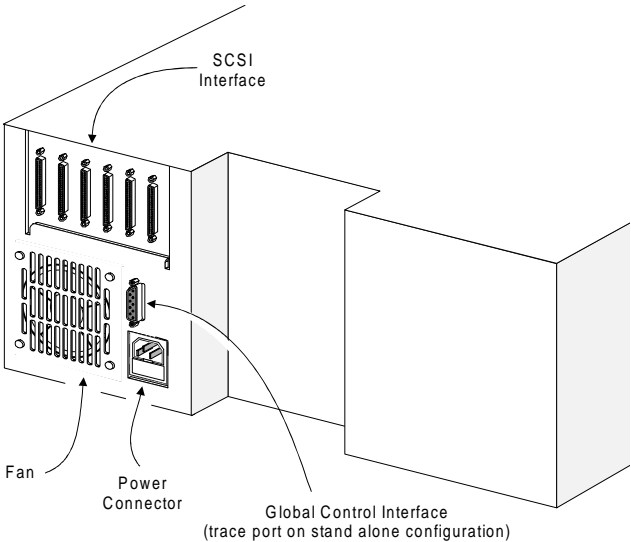


Figure 1-3 Rear View

Chapter 1 - Introduction

Integral Fan Cooling

The rear panel contains a single forced-air cooling fan. The fan prevents the drive and robotics electronics, the motors, and the power supply from overheating.

Library Robotics

The Base Module library robotics can load any of the cartridges from its removable 10-cartridge magazine into either of two DLTtape drives. Models LXB4110 and LXB7110 have only one drive per module.

Bar Code Reader

The optional bar code reader is mounted on the cartridge shuttle. It reads bar code labels attached to each cartridge and maintains the bar code data in memory as part of the library inventory records. An upgrade kit to add the bar code reader is available. See *Appendix B - Accessories/ Spares/FRUs* for the part number.

Advanced Design Features

The DLT LibraryXpress incorporates many significant improvements in tape drive and library design. The robotics design utilizes Overland Data's *Mainframe-Class™* Library Robotics, known for ruggedness and reliability. Importantly, the Library is designed to use highly reliable DLTtape IV media. DLTtape IV is rated at over 1,000,000 head passes. DLTtape IV cartridges are used by all DLT4000 and DLT7000 drives in both multi-module systems and in standalone libraries.

Embedded Diagnostics

The DLT LibraryXpress Base Module provides three levels of embedded diagnostics:

1. *The Power-On Self Test (POST)* - Performs various verification tests on the processor's host interface and device control functions, as well as memory tests, at power-up.

2. *User Diagnostics* - Let you change configuration options, and exercise the robotics under the Demo menu to assist in diagnosing faults.
3. *CE Diagnostics* - Provides more advanced diagnostics to Customer Engineers (CE) for servicing the Base Module. Both the User Diagnostics and the CE Diagnostics can be selected from the front panel.

Diagnostics are described in greater detail in *Chapter 2 - Installation* (configuration diagnostics) and *Chapter 5 - Troubleshooting* (remaining user diagnostics).

Error Checking

To ensure data integrity, the drives in the LXB4X10 and LXB7X10 Base Modules apply:

- Reed-Solomon error-correction codes of 16 KB with every 64 KB of user data
- A 64-bit cyclic redundancy code (CRC)
- A 16-bit error-detection code (EDC) for each 4 KB of recorded data
- An end-to-end 16-bit CRC for each user record.

Buffer

Each drive in an LXB4X10 is equipped with a 2-MB data buffer. Each drive in an LXB7X10 is equipped with an 8-MB data buffer.

Compression

The drives in the DLT LibraryXpress Base Module use the standard Digital Lempel-Ziv (DLZ) data compression algorithm.

Chapter 1 - Introduction

Capacity

A single Base Module with its ten-cartridge magazine offers formatted capacities as shown below. When the LXB4X10 uses DLTtape III or IIIXT cartridges, its capacity is limited accordingly.

Table 1-2 Tape Capacities

Cartridge	Capacity per Cartridge^A	Full Magazine Compressed^B	Drive Model
DLTtape III	10 GB	200 GB	LXB4X10
DLTtape III XT	15 GB	300 GB	LXB4X10
DLTtape IV	20 GB	400 GB	LXB4X10
DLTtape IV	35 GB	700 GB	LXB7X10

^ANative capacities, uncompressed.

^BMaximum capacities given assume average 2:1 compression. Actual compression will vary with file content. The native capacity for a full magazine is ten times the native capacity per cartridge.

Media Life

Table 1-3 Media Life

DLTtape Type	Head Passes	Tape Life
III	500,000	20 Years
IIIXT	1,000,000	30 Years
IV	1,000,000	30 Years

Related Publications

For additional information about the LXB4X10 and LXB7X10, and about the DLT LibraryXpress System product line, refer to the following publications:

- DLT Base Module Service Manual, P/N 104127-101
- DLT Base Module SCSI Specification, P/N 104134-101
- DLT LibraryXpress System Installation and User Manual, P/N 104139-101
- DLT LibraryXpress System Service Manual, P/N 104140-101.

Chapter 2 - Installation

There are three major steps to complete installation of the DLT LibraryXpress Base Module:

- Mechanical installation
- Cabling
- Configuration.

Mechanical installation consists of installing the module in a rack (for rack mounted units). No mechanical installation is required for desktop models.

Cabling consists of connecting the module to the host interface and terminating the busses properly.

Configuration consists of using the Configure Menu to customize the configuration options to your particular application if required. The default settings are often appropriate, and customization is not needed.

Mechanical Installation

Follow the directions in the shipping container to unpack the module and place it in the desired physical location. Save the packing materials for re-use in case you need to send the module to Overland Data for repairs. If the Base Module is to be added to an existing LibraryXpress system, please refer to the LibraryXpress System Installation and User Manual for information on mechanical installation.

Desktop Installation

There is no user assembly required. Place the drive on a stable horizontal surface with at least 2" clearance behind it to allow free flow of cooling air from the fan.

Chapter 2 - Installation

Note: If the Base Module is to be added to an existing LibraryXpress subsystem, or if you are expanding an existing desktop Base Module by adding a Global Control Module and additional LibraryXpress modules, all modules must be mounted in a rack. A kit is available to convert your existing desktop model for rack mounting. See Appendix B for ordering information.

Rack Mount Installation

The Base Module can be mounted in a standard 19-inch EIA/RETMA rack with a depth of 24 to 30 inches. The rack mount version is shipped with two rack slides installed.

If the Base Module is to be added to an existing LibraryXpress subsystem, please refer to the LibraryXpress System Manual for information on mechanical installation.

Note: The cooling fan at the rear of the drive must not be obstructed when the drive is installed in the rack. It is advisable to allow two inches of clearance behind the rear panel of the module.

CAUTION!

MAKE CERTAIN THAT WHEN THE MODULE IS FULLY EXTENDED THAT A FORCE OF 20% OF THE RACK WEIGHT, BUT NOT MORE THAN 57 LB. APPLIED IN ANY DIRECTION BUT UPWARDS DOES NOT CAUSE THE RACK TO OVERBALANCE.

VORSICHT:

BITTE BEACHTEN, DAß WAHREND DAS MODUL AUSGEZOGEN SIND, LEDIGLICH EINE ZUSÄTZLICHE LAST VON MEHRALS 20% DES GESTALLGEWICHTES, ABER NICHT MEHR ALS 26 KG IN ALLE RICHTUNGEN AUßER NACH OBEN, DIE STABILITÄT DES GESTALLS GEFÄHRDET.

Note: All of the screws, washers and nut-plates required for rack mounting are supplied with the Base Module. The slides must be fastened to the front rails of the rack using four 10-32 **low-profile** screws and the nut-plates provided. Two 10-32 clip nuts are provided to engage the captive screws on the front panel.

Follow the instructions below to install the LibraryXpress Base Module into a rack. You will need a #2 Phillips screwdriver and a flathead screwdriver. Refer to the figures as directed.

Note: The left and right slides are alike, so there is no risk of confusing the parts on re-assembly.

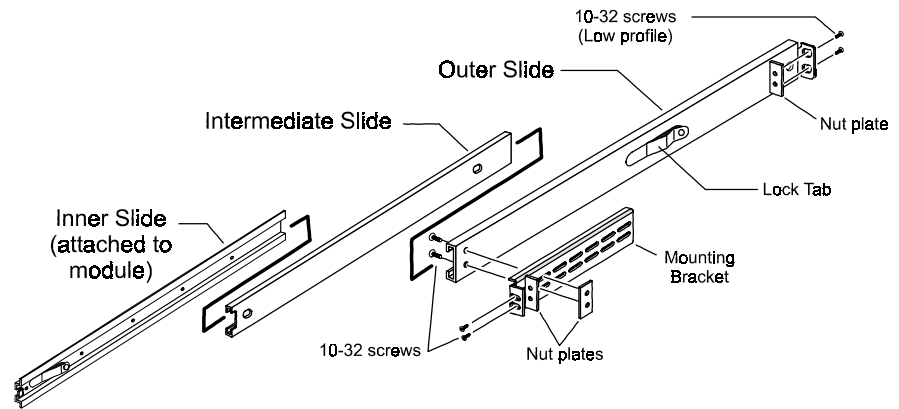


Figure 2-1 Rack Slide Parts

Chapter 2 - Installation

1. Refer to Figure 2-1 to identify and orient the parts of the slides. The slide is attached to the Base Module enclosure by means of three screws through the inner slide.
2. Refer to Figure 2-2. Separate each set of slides as follows:
 - a) Pull the outer slide toward the rear, along with the intermediate slide until the inner slide lock engages the intermediate slide.
 - b) Continue to pull the outer slide towards the rear until the outer slide lock engages the intermediate slide. Press down on the ***inner slide*** lock to permit the intermediate slide to continue to move toward the rear. Continue to move the outer and intermediate slides toward the rear until they are separated from the inner slide.

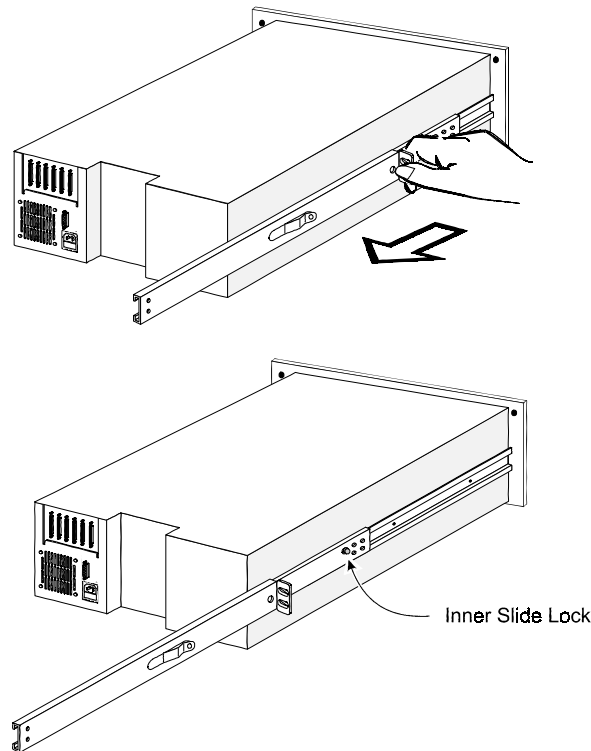


Figure 2-2 **Separating a Rack Slide**

3. Locate the screw holes in the front and rear rails of the cabinet or equipment rack where the drive is to be installed.
4. Loosely assemble a mounting bracket to each outer slide, using two 10-32 screws with washers and a nut-plate for each. Select slots in the mounting brackets so the length of the assembly equals the distance between the front and rear rails of the rack.
5. Fasten each outer slide *behind* the front rail of the rack using two 10-32 low-profile screws with washers and one nut plate.
6. Fasten each of the mounting brackets to the *front* of the rear rail of the rack using two 10-32 screws and one nut plate.
7. Tighten the screws installed in step 4.
8. If they are not already locked, pull the intermediate slides toward the front (out of the rack) so that they lock in the extended position.
9. **Note:** This step should be performed by two people. In front of the rack, lift the module to its installed height. Engage the inner slides mounted on the module with the intermediate slides protruding from the rack, and slide the module toward the rack until the inner slide lock engages the intermediate slide. This leaves the entire module protruding from the rack, locked in position, supported by slides.
10. Press inward (toward the module) on each of the inner slide locks to permit the intermediate slides to move toward the rack.
11. Slide the module in and out several times, ensuring that the inner and outer slide locks engage, and that the module does not bind against the slides.
12. If binding occurs, loosen the four screws that secure the slides to the front rails and the four screws that secure the slides to the rear rails.
13. If necessary, repeat steps 11 and 12 until the module does not bind against the slides.

Chapter 2 - Installation

14. If the rails on your rack are not threaded, install a clip nut on each front rail at the height of the captive screws on the front panel of the Base Module. If the rails on your rack are threaded, skip this step.
15. Slide the Base Module into the rack, and tighten the captive screws.

Interfaces and Cabling

Refer to Figure 2-3. If the Base Module is to be installed alone, that is, not as part of a multi-module subsystem, the connections required are the SCSI connection to the host, and the AC power connection. The Global Control interface connector is used only when the module is used in combination with other modules as part of a DLT LibraryXpress subsystem. If the Module is to be added to an existing DLT LibraryXpress subsystem, please refer to the DLT LibraryXpress System Installation and User Manual for information on cabling.

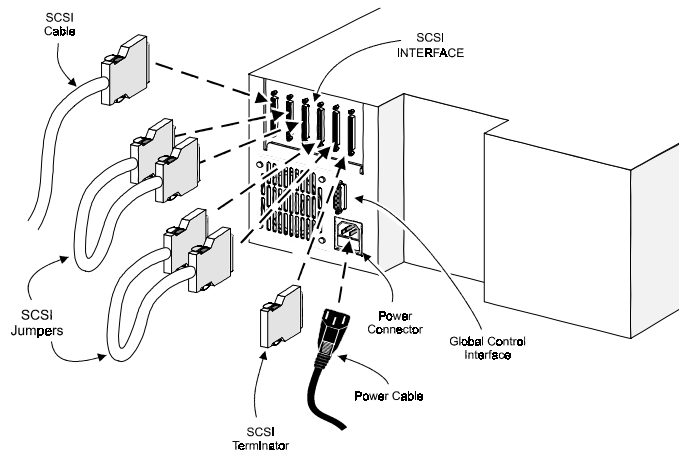


Figure 2-3 Rear Panel Connectors, Terminator and Cables
Shown with SCSI Jumpers for Daisy-Chained Configuration

Power Cable

The AC power cable is a standard grounding AC cable which attaches to a connector on the rear panel. Connect the cable to the connector on the module, and connect the other end to a reliably grounded AC outlet or rack power outlet.

To maintain product safety compliance, use a power cord with a suitable electrical rating that is approved for the country where the product is used. In the US, use a UL listed cord; in Canada, a CSA certified cord; and in Europe, use a Harmonized cord marked <HAR> or a nationally certified cord.

Note: After connecting the LibraryXpress Base Module to your AC source, It is a good practice to power up and test the module before connecting to the host computer.

SCSI Interfaces

The DLT LibraryXpress Base Module may be ordered with a choice of single-ended or differential SCSI-2 interfaces. The LXB4X10, Fast SCSI-2 interface, uses two female, high-density 50-pin D-series connectors per bus. SCSI-2 cables and terminators are secured to the connectors by spring loaded latches.

The LXB7X10, Fast/Wide SCSI Interface uses high-density 68-pin connectors. Fast/Wide SCSI cables and terminators are secured to the connectors by jackscrews.

Both of these SCSI interfaces are provided with independent bus wiring. That is, each drive has a separate bus, with a pair of SCSI connectors, and the library robotics has a separate bus, with a pair of SCSI connectors. In this configuration, there are six SCSI connectors on the rear panel. In the single-drive models, the connectors labeled DLT 2 are inactive. SCSI jumper cables can be used for daisy-chained applications.

Each of the drives and the library robotics are separate SCSI devices. Each requires a unique SCSI address if they are daisy-chained on the same bus.

Chapter 2 - Installation

A terminator of the proper type (single-ended or differential) must be installed on each unused connector of each bus, as explained below in the section headed 'Interface Cable and Terminator Installation. Figure 2-3 shows the SCSI cable, connectors and bus terminator used on the module.

In order to connect the module to a host computer system, the host system must have at least one SCSI controller and the appropriate driver software.

Your Technical Support representative is available to answer your questions about installation procedures for specific host systems.

Before cabling the system, see the recommended SCSI cable specifications in the following section. Also, see the section on Interface Cable and Terminator Installation later in this chapter.

Interface Cable Specifications

The DLT LibraryXpress is a high-performance system. To avoid degradation of performance, use the highest-quality interface cables. The detailed requirements for SCSI cables are set forth in ANSI X3.131-1994. It is recommended that all SCSI cables used with the DLT LibraryXpress Module meet at least the following requirements:

- Shielded or double-shielded, as required to meet EMI specifications
- Impedance match with cable terminators of 132 ohms, ideally
- Characteristic impedance between 90 and 132 ohms, required
- 25-pair twisted-pair should be used
- Each end of the twisted pair ground must be connected to chassis ground
- The maximum cable length for a single-ended Fast SCSI bus is 9.8 feet (3 m)*
- The maximum cable length for a differential Fast SCSI bus is 82 ft. (25 m)*
- Cables of different impedances should not be used together.

* When calculating the overall length of the bus, be sure to consider both the run length to the host and the internal cabling of the module. Nominal lengths are listed below:

Base Module:

LXB4X10

DLT1	19 inches (48 cm)
DLT2	27 inches (69 cm)

LXB7X10

DLT1	17 inches (43 cm)
DLT2	26 inches (66 cm)

SCSI Jumper 12 inches (30 cm)

Library (Both units) 36 inches (91 cm)

Additional specifications to assure the highest SCSI performance can be found in ANSI X3.131-1994 or later.

Note: This equipment has been tested for electromagnetic emissions and immunity using good quality shielded cables. The use of unshielded cables, poor quality cables or other variances from good practice may result in non-compliance with national and international rules.

Terminators

A terminator must be installed on the drive if the drive is to be used at either end of a SCSI bus, such as the first or last device along a daisy-chain, or as a single SCSI peripheral. The appropriate type and quantity of terminator is shipped with your module. It is packaged in the accessory bag that arrives with the module. **Notes:** 1) It is important to use only differential terminators on a differential SCSI bus; 2) Active terminators are strongly recommended for single-ended applications.

Note: This equipment has been tested for electromagnetic emissions and immunity using good quality shielded terminators. The use of unshielded terminators, poor quality terminators, or other variances from good practice may result in non-compliance with national and international rules.

Interface Cable and Terminator Installation

In the interest of clarity, let us assume that the incoming SCSI bus will be connected to the left of a pair of parallel connectors, and that the terminator or the outgoing SCSI bus will be connected to the right of a pair of connectors. To properly cable the drive:

1. Make sure that your host system has appropriate SCSI interface card or cards and software drivers installed. Note whether the interface is *single-ended* or *differential*.
2. Inspect the Library and the terminator to determine whether they are single-ended or differential type to match your system. SCSI terminators should be clearly marked single-ended or differential.
3. Determine whether the module's elements (DLT 1, DLT 2, Library) are to be used with separate SCSI buses or daisy-chained on a single SCSI bus. (Refer to figure 2-3.) If daisy-chained, make the necessary connections among the connectors on the module. That is, right connector of Library to the left connector of DLT1, and if there are two drives, the right connector of DLT 1 to the left connector of DLT 2. This leaves you with the left Library connector as an incoming SCSI connector, and the right DLT 2 (or DLT 1) connector as an outgoing SCSI connector.
4. Determine whether the module is to be connected in daisy-chain fashion with other devices.
 - If not used in a daisy-chain, install the terminator in the outgoing SCSI connector. In a single-drive module, this will be the right DLT 1 connector, as the connectors marked "DLT 2" are not active. Connect the host cable at the incoming SCSI connector, the left Library connector.

- If used in a daisy-chain, and the module is the last device of the chain, install the terminator in the outgoing SCSI connector. If the module is not last, do not use the terminator. Connect the cable for the next device in the chain to the outgoing SCSI connector. Connect the host cable or the cable from the preceding device to the incoming SCSI connector, the left Library connector.
5. Make sure that each cable you use meets the specifications listed earlier in this chapter.
 6. Measure the cable length to connect the module to the computer system.
 7. Be sure that the length of the entire bus falls below the maximum permissible length given in the section on SCSI cable specifications.

Configuration

The LibraryXpress Base Module is designed with several configuration options, each offering multiple settings to support a variety of applications and platforms. The setting of each option is stored in non-volatile memory in the module. For most applications, you will not need to change the factory default settings. If you need to change the configuration, go on to the next section. If you are uncertain whether you need to change a setting, contact your Technical Support representative.

To change settings, you need to use the Control Panel. For an overview of how the Control Panel works, and a description of the functions of the buttons, indicators and display, refer to the sections titled *Entering the Menu Mode*, *Exiting the Menu Mode*, and *Navigating Through the Menu Structure* in *Chapter 3 - Operation*.

The settings can be changed using the procedure described below under *How to Customize Configuration*. Before changing any configuration settings, consult your host system documentation to determine which settings may need to be changed.

A Configuration Example - Setting the SCSI ID

1. Turn the system on. Wait until the Power-On Self Test terminates and the default screen appears on the display. Figure 2-4 shows a typical default screen. Yours may vary depending on the number of drives in your system.

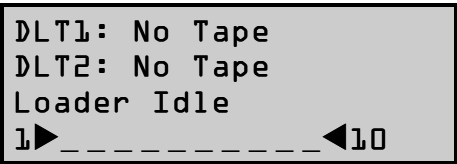


Figure 2-4 Default Screen

2. At the Default Screen, press the **Enter** button. The display will show the Main Menu, as in Figure 2-5.

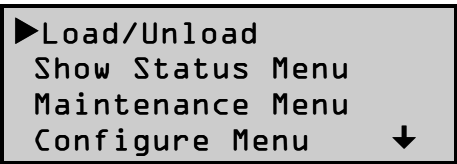


Figure 2-5 Main Menu

3. Press the ▼ button three times to move the ► to Configure Menu, then press the **Enter** button. The display will show the Configure Menu, as shown in Figure 2-6. Note that the ↓ at the end of the fourth line means that there are additional configuration options that can be reached by scrolling with the ▼ button.

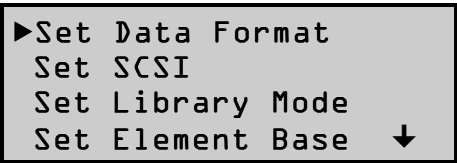


Figure 2-6 Configure Menu

4. To select a configuration option, press the ▲ or ▼ button on the control panel until the ► on the display is next to the option you want to change. In this case, let us choose Set SCSI. Press the Enter button to display the choices for that option. The submenu in Figure 2-7 appears.

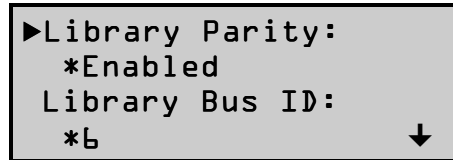


Figure 2-7 Set SCSI Submenu

Note: Take a moment to look closely at the submenu in Figure 2-7. Note that the ► on the display is next to line 1, *and* that line 2 is indented. This tells you that Figure 2-7 is a *two-tiered menu*. The ▲ and ▼ buttons work on two levels in this kind of menu, which is typical of many submenus of the Configure Menu. The first level is as follows: If you press the ▼ button, the ► moves to line 3. If you press the ▲ button, the ► moves back to line 1.

If you press the **Enter** button while the ► is next to line 1 (or line 3), the ▲ and ▼ buttons operate on the second level. You can tell because the ► moves next to line 2 (or line 4), and a ↓ appears at the end of line 4, indicating that there is a list of settings that can be scrolled using the ▲ and ▼ buttons.

The ↓ at the end of line 4 means that there are other items that can be displayed by scrolling, using the ▼ button repeatedly.

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5. Note that the Library SCSI ID is set to 6. Suppose you want to set the DLT1 bus ID to 4. With the ► next to line 1, press the ▼ button repeatedly until the display scrolls as shown in Figure 2-8:

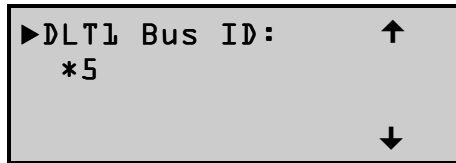


Figure 2-8 Set SCSI Submenu Scrolled

6. With the ► next to line 1, press the **Enter** button. The ► moves to line 2 and the ▼ remains at the end of line 4, and a ▲ appears at the end of line 1. Now you can use the ▲ and ▼ buttons to scroll line 2 to display the possible settings. Scroll downward so that 4 is displayed, then press the **Enter** button to save the new selection. An * indicates that it is the current selection.
7. Press the **Escape** button repeatedly until the submenu in Figure 2-6 reappears.
8. Repeat this procedure for each configuration option you want to change.

Note: Some configuration changes only take place after you reboot. To reboot the system, go to the Maintenance Menu. Press the ▼ button until *Reboot Module* is selected, then press the **Enter** button.

Reserved Slots

Some host software imposes size limits on tape library magazines for licensing purposes, and will not operate with a library that exceeds the licensed size. This configuration option enables you to withdraw some of the slots in the LibraryXpress System from use as storage slots in order to meet licensing requirements or to reserve a slot for use with the AutoClean feature.

1. As shown in Figures 2-4 through 2-6, navigate from the Default Screen through the Main Menu to the Configure Menu.

2. Scroll down on the Configure Menu until you see 'Set Reserved Slots,' and select that option. The screen shown in Figure 2-9 appears.

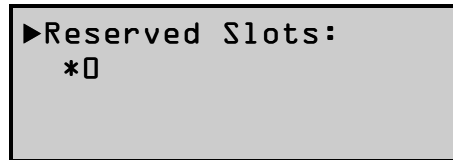


Figure 2-9 Set Reserved Slots Menu

3. With the ► next to line 1, press the **Enter** button. The ► moves to line 2, a ▼ appears at the end of line 4, and a ▲ appears at the end of line 1. Now you can use the ▲ and ▼ buttons to scroll line 2 to specify the number of slots to be reserved. Scroll to the desired number, then press the **Enter** button to save the new selection.
4. Press the **Escape** button repeatedly to return to the Default Screen.

Descriptions of Configuration Options

The items available on the Configuration Menu are as follows:

Set Data Format: This setting lets you:

1. Set the data format to:
 - Auto Selection
 - THZ01
 - THZ02
 - DLT2000
 - DLT2000XT
 - DLT4000
 - DLT7000.

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2. Enable or disable data compression—Compression cannot be enabled when either THZ01 or THZ02 format is in use. This setting applies to the next or the currently loaded cartridge only. An unload command returns to the default. This setting does not display the format of the loaded tape. Use the *Show Status Menu* for this purpose. The defaults are Auto Selection for both density and compression.

Set SCSI: This setting lets you:

1. Enable or disable the robotics SCSI bus parity checking
2. Set the SCSI addresses of the drives and the robotics. The defaults are:
 - Library Parity = ON
 - Library Bus ID = 6
 - DLT 1 Bus ID = 4
 - DLT 2 Bus ID = 5

Set Library Mode: This setting lets you switch the robotics operating mode between *Random* or *Sequential*.

- Random is the normal operating mode which affords complete host control of the robotics. Random is the default.
- Sequential mode is locally controlled. Sequential operations begin by loading a cartridge into DLT1 with the operator panel. The LibraryXpress monitors the status of DLT1, and when the cartridge is unloaded by the host, it returns the cartridge to the magazine, then loads the next cartridge in magazine numerical order. This operation continues to cycle until all of the cartridges have been loaded, or until an empty slot is encountered.

When you select Sequential, an additional Sequential Mode option appears that lets you select *Normal* or *Recirculate* options. Normal option operates as described above. In Recirculate mode, instead of stopping after the cartridge in the last slot has been unloaded by the host, the operation continues by loading the cartridge in Slot 1. Recirculation will continue until an empty slot is encountered. The default for Sequential Mode is Normal.

Set Element Base: This setting lets you set the base addresses of each of the SCSI *elements* of the module. In order to identify sources and destinations in SCSI commands to the robotics, the LibraryXpress is divided into elements, each of which is assigned a separate designator or *element address*:

- The *Transport Element* is the robotics mechanism itself
- The *Storage Elements* are the ten slots in the magazine
- The *Transfer Elements* are the drive(s).

The LibraryXpress reports these settings in response to the SCSI Mode Sense command, in the Element Address Assignment Page. The defaults are:

- Transport Element = 0000
- Storage Element Base = 0001
- Transfer Element Base = 00F0 (DLT 1).

Set Identification: This setting enables you to specify the response of the library robotics to the SCSI Inquiry command in the Vendor ID and the Product ID fields. The defaults are:

- Vender ID = OVERLAND
- Product ID = LXB.

Specifying Customer-Unique Device Identification

The Identification option in the Configuration Menu lets users identify their LibraryXpress as a device in their network computer system. Specific settings lets you specify a unique vendor ID and product ID. These unique IDs can be of particular value where certain types of host software recognize only a limited set of device names. The custom ID capability lets LibraryXpress respond as host-recognizable devices and communicate properly.

To specify a unique vendor ID/product ID:

1. From the Main Menu, select *Configuration Menu*. The screen lists the configuration options.

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2. Use the ► button to scroll down to the *Set Identification* option, and press the **Enter** key. This screen appears:

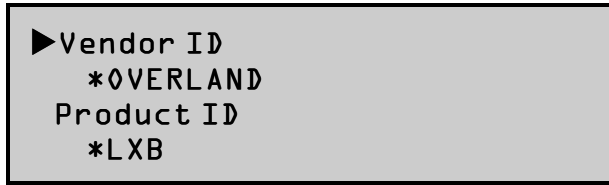


Figure 2-10 Set Unique ID Screen

3. Position the button next to Vendor or Product ID, and press the **Enter** key.
4. The ▼ button drops to second menu tier and the screen displays the first of a list of ID options.
5. Scroll through the list to display <Vendor or Product Unique>, and press the **Enter** key. (If you select, for example, Vendor Unique, the following screen appears):

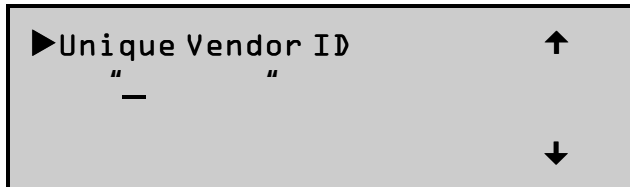


Figure 2-11 Setting Unique Vendor ID

The screen shows a blank space between quotation marks with a blinking cursor beneath the first character position.

6. Use the ▼ and ▲ buttons to display a character in the first position. The ▲ button scrolls through:
 - a) an upper case alphabet
 - b) digits 0-9
 - c) a lowercase alphabet
 - d) a series of special characters.
7. The ▼ button scrolls backward through the series.

8. Press the **Enter** key to accept the first character and advance the cursor to the next position.
9. Continue entering as many as eight characters.
10. Press **Escape** when you are finished.
11. Press **Enter** to accept your ID.

Set Date: Lets you set the module's calendar.

Set Time: Lets you set the module's clock.

Set Baud Rate: Lets you set the data transmission rate of the module's trace port. This function is intended for use by Customer Engineers only. The default is 38400 bits/sec.

Set Serial number: This setting lets you alter the library's serial number as stored in the unit. The library's robotics reports these settings in response to the SCSI Inquiry command, in the Unit Serial Number Page.

Set Unload Mode: This setting determines whether a SCSI Move Medium command is interpreted as *implicit* or *explicit*. If implicit, the module, in response to a Move Media command, unloads a drive before attempting to move a cartridge from that drive. If explicit, the host must issue a SCSI Unload command to a drive before each Move Medium command that removes a cartridge from that drive. The default is *Implicit*.

Set Autoclean Mode: This setting allows you to enable an automatic cleaning cycle which operates as part of the cartridge unload sequence whenever the *Use Cleaner LED* comes on. To use this option, you must reserve a slot for a cleaning cartridge using the *Reserved Slots* option. The default is *Disabled*.

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Set Negotiation: This option offers two choices:

1. Initiate Synchronous Negotiation
2. Set Transfer Rate.

Initiate Negotiation, if set, allows the LibraryXpress to initiate SCSI Synchronous Negotiation with the host (the default is No). The LibraryXpress always responds to host-initiated negotiation.

Set Transfer Rate can be set to 10 Mbytes/sec, 5 Mbytes/sec or Asynchronous. The default is 10 Mbytes/sec.

Set Reserved Slots: Some host software imposes size limits on tape magazines for licensing purposes, and will not operate with a library that exceeds the licensed size. This setting enables you to withdraw from use a specified number of the slots in the magazine. At least one reserved slot is required in order to use the Autoclean option.

Set Special Configuration: This option lets you access a submenu of special configuration settings described below:

1) Mode PG 1F Length Enables you to choose between two lengths of the Mode Sense/Select Device Capabilities Page (SCSI Page 1Fh), which are 14 bytes and 18 bytes, to accommodate different SCSI device implementations of this page. The default is Short.

2) Model Number Enables you to change the model number information displayed on the initial screens. You can choose between OVERLAND 'LX - - - - -', a blank line, DIGITAL TL89X, 'IMATION DLT- - - - -', and a vendor unique designator. The default is 'OVERLAND LX - - - - -'.

3) TUR Reporting Enables you to set the module to report Good status in response to a SCSI Test Unit Ready command when the module is in the Sequential Mode. Ordinarily, the module returns Not Ready status when in the Sequential Mode. This is needed because some software is unable to issue a Mode Select command to terminate Sequential Mode when the TUR command returns Not Ready. Possible settings are Custom, which returns Good when in Sequential Mode, and Standard, which returns Not Ready in Sequential Mode. The default is *Standard*.

- 4) *Init. Elem. Status*** Enables you to specify the module's response to the SCSI Initialize Element Status command. The possible settings are No Inventory, Force Inventory, and Force Label Scan. The default is No Inventory.
- 5) *Unit Attn. Report*** Enables you to specify the format of the Unit Attention report. If set to All, the unit reports all unit attention conditions in sequence; if set to One, the unit reports only the highest priority condition.
- 6) *Alternate Config.*** Enables you to configure the library as a standalone unit or a slave unit when used with a Global Controller.
- 7) *Element Based*** Enables the display of each SCSI element in the unit to begin with either zero or one. This affects *only* the front panel display, not the actual SCSI element addresses.
- 8) *Label Size*** Enables you to limit the length of the bar code label reported in the response to the SCSI Read Element Status command. It does not affect the front panel Bar Code Info display of bar code label contents. This option is to accommodate software that requires that bar code labels be less than eight characters in length. The possible settings are 1 through 8. The default is 8.
- 9) *Label Alignment*** Allows you to set the alignment of the bar code label information reported in the response to the SCSI Read Element Status command. The settings are Left and Right. When used in conjunction with the label size option above, it can strip unwanted trailing characters (Left alignment) or unwanted leading characters (Right alignment). The default is Left alignment.
- 10) *Abort Move Status*** Enables you to specify the module's response if it receives a SCSI Reset or Abort command while a Move Medium command is in progress. Depending on this setting, during execution of the Move Medium command, the module will return either Busy or Not Ready in response to the SCSI Reset or Abort commands. The default is a Busy response.
- 11) *AutoClose*** Enables you to enable or disable the automatic closing of the magazine door. The default is *Enabled*.

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- 12) Door Open Response** Enables you to determine the response to a SCSI command when the magazine door is open. The responses are *Ready* (default) and *Not Ready*.
- 13) SCSI Mode** Lets you specify the appropriate SCSI command set for your LibraryXpress model. The choices are SCSI-2 (default) or SCSI-3.
- 14) Post Recovered Error** Setting this parameter enables the reporting of TapeAlert informational exception conditions with a Recovered Error sense key, when the Method of Reporting Information Exceptions (MRIE) field is set to a value of 0x3 in Mode Page 1Ch, or if the TapeAlert Mode option is set to Rec. Error (cnd). The default is *Disabled*.
- 15) TapeAlert Mode** This option specifies the conditions that TapeAlert data will be logged and reported. Select:
- **Logging Disabled** to inhibit the logging feature.
 - **No Exceptions** if the device should not report information exceptions.
 - **Unit Attention** if the device should report information exceptions with a Unit Attention sense key and an ASC/ASCQ of 5D/00.
 - **Rec. Error(cnd)** if the device should report information exceptions with a Recovered Error sense key and an ASC/ASCQ of 5D/00, if Recovered Error Reporting is enabled.
 - **Rec. Error(unc)** if the device should unconditionally report information exceptions with a Recovered Error sense key and an ACS/ASCQ of 5D/00.
 - **No Sense** if the device should report information exceptions with a No Sense sense key and an ASC/ASCQ of 5D/00.
 - **On Request** if the device should report information exceptions with a *No Sense* sense key and an ASC/ASCQ of 5D/00, *only* in response to an unsolicited Request Sense command. The default is *Logging Disabled*.

Set Default: This option resets all of the preceding configuration options to their factory defaults. Submenu options are ODI Defaults and DEC Defaults.

Table 2-1 shows the configuration items for the DLT LibraryXpress System. The item names are shown in the first column, while variations or components of the items appear in the second column. The specific settings available for any item are shown in the third column, with the default selection appearing in bold text.

Note: The settings and options listed in this table may vary among different models and different firmware levels of the DLT LibraryXpress System.

Table 2-1 LibraryXpress Configuration Options

Item Name	Item Component	Configuration Setting
Set Data Format	Density DLTn	Auto Selection , THZ01, THZ02, DLT2000, DLT2000XT, DLT4000, DLT7000
	Compression	Auto Selection , On, Off
Set SCSI	Library Parity	Enabled , Disabled
	Library Bus ID	0, 1, 2, 3, 4, 5, 6 , 7 (8, 9, 10, 11, 12, 13, 14, 15 wide only)
	DLT1 Bus ID	0, 1, 2, 3, 4 , 5, 6, 7 (8, 9, 10, 11, 12, 13, 14, 15 wide only)
	DLT2 Bus ID	0, 1, 2, 3, 4, 5 , 6, 7 (8, 9, 10, 11, 12, 13, 14, 15 wide only)
Set Library Mode Not available on LXG	Library Mode	Random , Sequential DLT1, Sequential DLT2, Sequential Split
	Sequential Mode	Normal , Recirculate (doesn't show if Random)
Set Element Base	Transport	0x0000
	Storage	0x0001
	Transfer	0x00F0
	Import / Export	0x00E0 (Not available on standalone)
Set Identification	Vendor ID	OVERLAND , EXABYTE, DEC,

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Item Name	Item Component	Configuration Setting
		Quantum, <Vendor Unique>
	Product I:	<u>LXB</u> , LXG, LXS, EXB-210, EXB-440, EXB-480, TZ Media Changer, TL800 (C) DEC, <Vendor Unique>
Set Date	Day	
	Month	
	Year	
Set Time	Hour	
	Minute	
Set Baud Rate	Baud Rate	2400, 9600, 19200, <u>38400</u> , 57600, 115200, Auto
Set Serial Number	Serial Number	<u>“9999999999”</u>
Set Unload Mode	Unload Mode	<u>Implicit</u> , Explicit
Set AutoClean Mode	AutoClean Mode	<u>Disable</u> , Enable
Set Negotiation Mode	Negotiation Mode	<u>Do Not Initiate</u> , Initiate
	Transfer Rate	<u>Sync 10Mb/sec</u> , Sync 5Mb/sec, Asynch. Only
Set Mail Slot	Mail Slot Emul	<u>Disabled</u> , Module X Enabled
Set Reserved Slots	Reserved Slots	<u>0</u> , 1 - X (X = one less than total slots available)
Set Special Config.	Mode Page 1F Length	<u>Short (0x0E)</u> , Long (0x12)
	Model Number	<u>Overland LX</u> ____, Blank Line, Digital TL89X, Imation DLT _____<Vendor Unique>
	TUR Reporting	<u>Standard</u> , Custom

Item Name	Item Component	Configuration Setting
	Init. Elem. Status	<u>No Inventory</u> , Force Inventory, Force Label Scan
	Unit Attn. Report	<u>All</u> , One
	Alternate Config.	<u>Standalone</u> , Slave
	Element Based	<u>One Based</u> , Zero Based
	Label Size	1 - <u>8</u>
	Label Align	<u>Left Align</u> , Right Align
	Abort Move Status	<u>Busy</u> , Not Ready
	AutoClose	<u>Enable</u> , Disable
	Door Open Response	<u>Ready</u> , Not Ready
	SCSI Mode	<u>SCSI-2</u> , SCSI-3
	Post Recv'd Error	<u>Disabled</u> , Enabled
	TapeAlert Mode	<u>Logging Disabled</u> , No Exceptions, Unit Attention, Rec. Error (cnd), Rec. Error (unc), No sense, On Request
Set Default	Set Default	<u>ODI Defaults</u> , DEC Defaults

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Front Panel

The front panel includes the power switch, the magazine door, the Magazine Security Lock, the Unlock/Open button with its Locked indicator, and the control panel which has buttons, a display and indicators. Figure 3-1 shows the front panel.

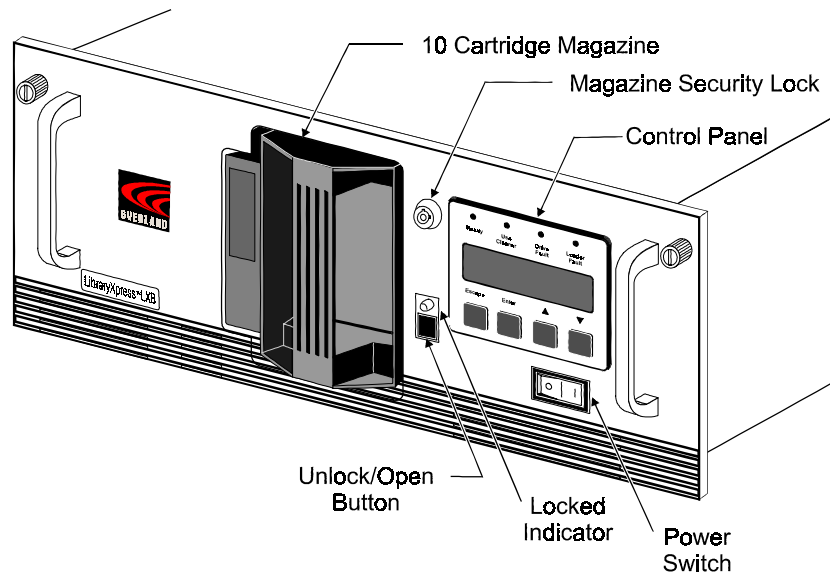


Figure 3-1 Front Panel

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Power Switch

The power switch controls the supply of AC power to the module. It is set into a recess in the front panel to prevent accidental operation. Press **I** to turn the module ON and **0** to turn the module OFF.

Magazine Security Lock

The Magazine Security lock is an electronic switch that prevents unwanted removal of the magazine. The switch is actuated by a key and can be placed in a locked or unlocked position. When set to the locked position the switch disables the Unlock/Open button.

Unlock/Open Button

When the Magazine Security Lock is switched to the unlocked position, use this button to disengage the magazine locking mechanism and allow removal of the magazine. The button has no effect when the Magazine Security Lock is locked.

Locked Indicator LED

This LED indicates whether the magazine is locked inside the module or is freely removable. The LED illuminates after you insert a magazine into the module and it locks into position. The LED continues to glow steadily while the magazine is locked inside the module.

When you press the Unlock/Open button, the LED blinks momentarily. When the LED remains continuously off, and the control panel displays the *Door Open* message, you can remove the magazine.

Control Panel

The control panel consists of four LED indicators, a four-line by 20-character backlit LCD display, and four buttons. Figure 3-2 shows the control panel.

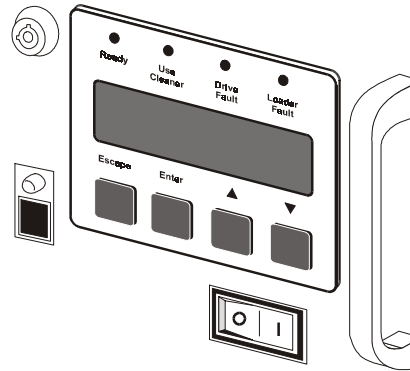


Figure 3-2 Control Panel

Indicators

There are four LED indicators on the control panel, labeled **Ready** (green), **Use Cleaner** (yellow), **Drive Fault** (red), and **Loader Fault** (red).

The **Ready** indicator (green) is illuminated when the Base Module is ready to accept commands, either from the Control Panel or from the host computer. The **Ready** indicator goes out when you enter the Menu Mode.

The **Use Cleaner** LED (yellow) indicates that either or both drives require cleaning. A cleaning operation should be performed as described in *Chapter 4 - Maintenance*. When the **Use Cleaner** LED comes on, you can find out which drive needs cleaning by looking at the Cleaning Needed status on the Drive Status submenu.

When either the **Drive Fault** or the **Loader Fault** LED (red) is illuminated, a Fault Screen appears on the LCD display. The Fault Screen is described later in this chapter. A list of fault symptom codes (FSC) appears in *Chapter 5 - Troubleshooting*.

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Buttons

There are four buttons on the control panel, labeled **Escape**, **Enter**, **▲**, and **▼**. The buttons do not directly control specific functions or options. Instead, you use the buttons to navigate from the Default Screen through a multi-level menu structure, then select the desired option from the appropriate menu using the **Enter** button. Table 3-1 describes the effect of each of the four buttons under various conditions.

The three most important things you need to know about the buttons are:

- 1) To enter the Menu Mode and display the Main Menu from the Default Screen, press the **Enter** button.
- 2) To return to the Main Menu from a submenu, press the **Escape** button repeatedly until the Main Menu appears. Pressing the **Escape** button while the Main Menu is displayed exits the Menu Mode and returns you to the Default Screen. The Default Screen is shown in Figure 3-5; the Main Menu is shown in Figure 3-8.
- 3) To display the Show Status Menu *only* without entering the Menu Mode, press the **Escape** button at the Default Screen. The system remains online.

Important Note: When you enter the Menu Mode, the **Ready** light goes out. This means that the module is *off-line*, and the system responds to all commands from the host with a SCSI 'Not Ready' until you exit the Menu Mode and the **Ready** light goes on.

Table 3-1 Control Panel Button Functions

	Escape	Enter	▲	▼
At POST Screen	N/A	N/A	N/A	N/A
At Default Screen	Displays Show Status Menu	Enters Menu Mode	N/A	N/A
At Status Menu (while online)	Returns to Default Screen	Same as in Menu Mode	Same as in Menu Mode	Same as in Menu Mode
In Menu Mode	Rejects Currently Displayed Choice, or Aborts Control Panel Operation In Progress, or Exits to Next Higher Menu Level, or Exits Menu Mode to Default Screen	Accepts Currently Displayed Choice	Moves ► 1 Line Upward through List of Options, or Scrolls Part of Display 1 Line toward Top of List of Options	Moves ► 1 Line Downward through List of Options, or Scrolls Part of Display 1 Line toward Bottom of List of Options
At Fault Screen	N/A	Clears Soft Errors	N/A	N/A

Note: There is an auto-repeat feature for the ▲ and ▼ buttons. When the user presses either button for more than one-half second, the control panel behaves as if the user were pressing and releasing the button about four times per second. This effect stops when the user releases the button.

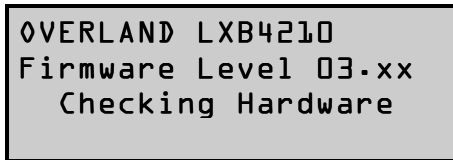
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Display Messages

The display on the control panel is capable of displaying four lines of 20 characters each, to allow the use of easy-to-understand messages. Many of these messages and their functions are described in this chapter. Those displays that are described in other chapters are cross-referenced here as well.

Power-On Self Test Screen

When power is first applied to the module, a series of power-on self test (POST) diagnostics are performed. During POST execution, the model number of the module, the current date and time, the firmware revision, and the status or result of the test in progress are displayed on the control panel as shown in figure 3-3.



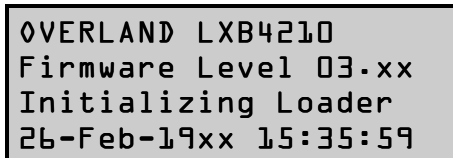
```
OVERLAND LXB4210
Firmware Level 03.xx
Checking Hardware

```

Figure 3-3 POST Screen

Initialization Screens

After the POST is completed, the library robotics system is initialized. A series of screens similar to Figure 3-4 is displayed during this process.



```
OVERLAND LXB4210
Firmware Level 03.xx
Initializing Loader
26-Feb-19xx 15:35:59

```

Figure 3-4 Initialization Screen

Default Screen

After the POST diagnostics have concluded successfully and initialization is complete, the default screen appears, as shown in Figure 3-5.

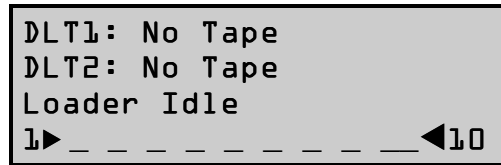


Figure 3-5 Default Screen

The first and second lines of the Default Screen show the status of the two drives within the Base Module. Possible status conditions of the drives are:

- No Tape
- Idle
- Rewinding
- Seeking
- Reading
- Writing
- Erasing
- Cleaning
- Unloaded
- Loading
- Unloading
- Calibrating
- In Flux.

The third line of the display tells the status of the library robotics. Possible conditions of the library robotics are:

- Loader Idle
- Fetch
- Stow
- Waiting For Loader
- Taking Inventory
- Elevator Home
- Checking Drive(s)
- Orphaned Cartridge
- Trapped Cartridge
- Scanning Labels.

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The fourth line displays a map of the magazine showing the contents of its 10 slots. The underline mark indicates there is no cartridge present in a given slot. When a cartridge is present, a block (■) is placed in the corresponding slot position. If no magazine is installed, line 4 says *No Magazine*.

Fault Screen

When a fault is detected, a screen similar to Figure 3-6 appears. At the same time, either the Drive Fault or the Loader Fault LED is illuminated.

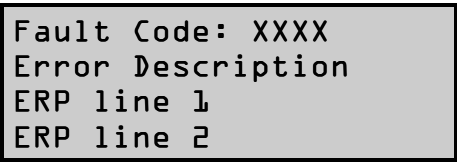


Figure 3-6 Fault Screen

The first line in Figure 3-6 shows a numerical Fault Symptom Code (FSC). The second line shows a brief description of the error, in place of *Error Description*. The third and fourth lines display a one- or two-line message describing the ERP in place of the words shown in the figure.

A list of Fault Symptom Codes appears in *Chapter 5 - Troubleshooting*.

Control Panel Display Modes

As previously described, the POST Screens, the Initialization Screen and the Default Screen appear without operator or host intervention. The Fault Screens appear whenever a fault occurs. The screens which follow appear in response to operator actions.

The LibraryXpress Menu Structure

Figure 3-7 shows the structure of the LibraryXpress menus. The available menu options can vary according to the specific DLT LibraryXpress System model or firmware revision level.

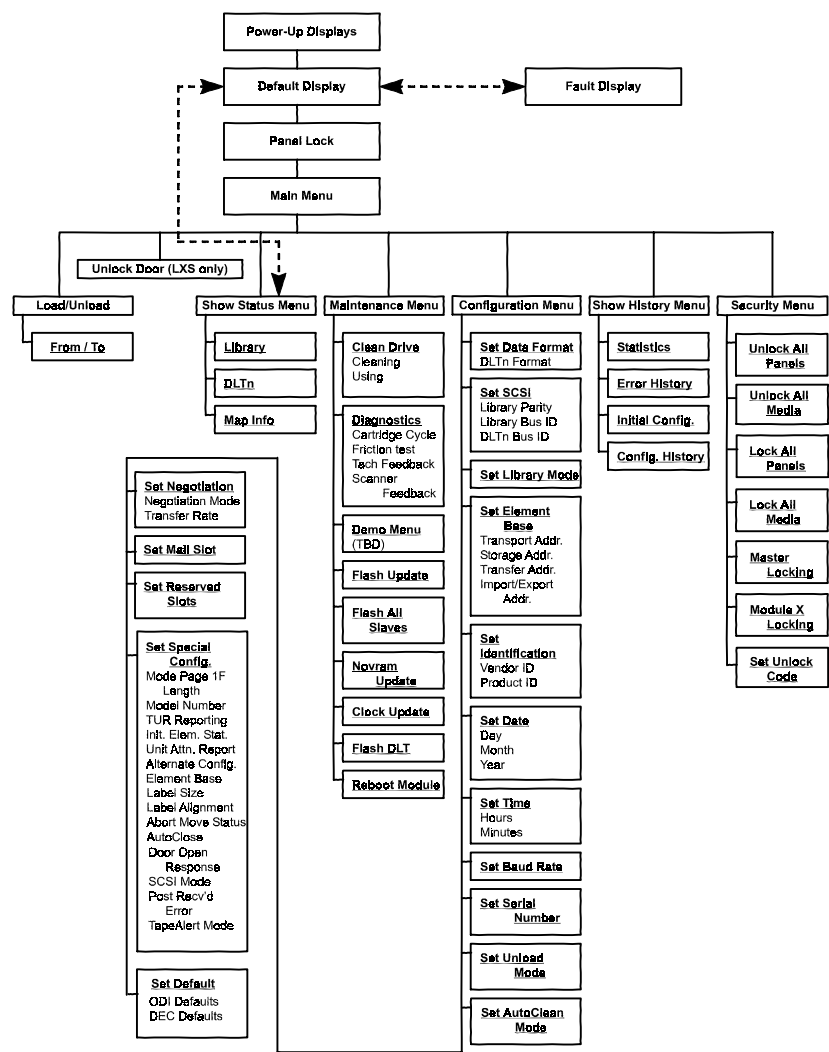


Figure 3-7 LibraryXpress Menu Structure

Entering the Menu Mode

Important Note: When you press the **Enter** button to enter the Menu Mode, the **Ready** light goes out. This means that the module is *off-line*, and the module responds to all commands from the host by reporting Not Ready until you exit the Menu Mode and the **Ready** light goes on.

To prevent inadvertent interruption of host operations, you may lock out the Menu Mode using the Security Menu. See the section titled ‘Security Menu’ later in this chapter. When the control panel is locked, you must enter your unlock code in order to display the Main Menu. Note that the Show Status Menu is remains accessible. It may be displayed from the Default Screen at any time by pressing the **Escape** button.

When the Default Screen appears on the screen, you can enter the Menu Mode by pressing the **Enter** button. The Main Menu shown in Figure 3-8 appears.

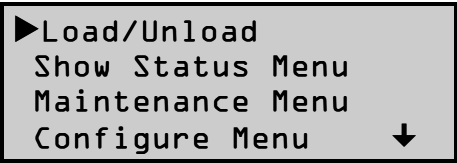


Figure 3-8 Main Menu

If the Control Panel has been locked, the screen shown below appears instead of the Main Menu:

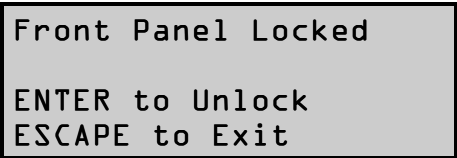


Figure 3-9 Front Panel Locked Screen

Note: You must know the module security code before you can proceed.

Exiting the Menu Mode

To leave the menu mode and return to the Default Screen, press the **Escape** button repeatedly. Each time you press the **Escape** button, the display moves to a higher menu level. When the Main Menu is visible, pressing the **Escape** button once returns to the Default Screen.

Note: When you see a **↑** on line 1 or a **↓** on line 4 of the display, this means that some or all of the display may be scrolled up or down or both to reveal more choices.

Navigating Through the Menu Structure

To select a submenu, move the **▶** on the display to the desired line using the **▲** and **▼** buttons. Then press the **Enter** button to confirm your choice and display the submenu. The **↓** at the end of the fourth line of the Main Menu means that there are one or more additional items that can be reached by scrolling, using the **▼** button. The items available on the Main Menu are:

- Load/Unload
- Show Status Menu
- Maintenance Menu
- Configure Menu
- Show History Menu
- Security Menu.

The following paragraphs describe the submenus that correspond to each of the Main Menu selections.

Load/Unload Menu

The Load/Unload Submenu is described later in this chapter, under the heading *Loading and Unloading Tapes*.

Show Status Menu

Note: You can select the Show Status submenu directly from the Default Screen without entering the Menu Mode by pressing the **Escape** button. In this way, you can check status at any time without interrupting host operations.

When you select Show Status, either from the Main Menu or from the Default Screen, the submenu shown in Figure 3-10 appears.

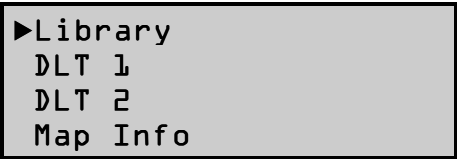


Figure 3-10 **Show Status Menu**

The items available on the Show Status menu are:

- Library
- DLT1
- DLT2 (if installed)
- Map Info.

Move the ► up or down with the ▲ and ▼ buttons, then press the **Enter** button to select the item.

Library Status Submenu

When you select Library, the submenu in Figure 3-11 appears:

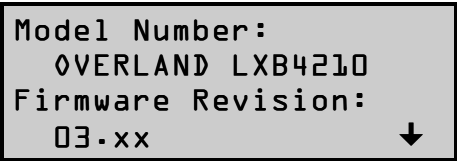


Figure 3-11 **Library Status Submenu**

You can scroll through the following list of Library Status categories:

- Model Number
- Firmware Revision
- Date
- Time
- Loader Status
- Library Mode
- Library Configuration
- Vendor Identification
- Product Identification
- Transport Address
- Storage Address
- Transfer Address
- Serial Number
- Wide SCSI
- SCSI Bus ID
- SCSI Bus Parity
- Negotiation Mode
- Transfer Rate
- Unload Mode
- Auto Clean Mode
- Reserved Slots
- Mode Page 1F Length
- TUR Reporting
- Initialize Element Status
- Unit Attention Report
- Boot Version
- Flash Type
- Baud Rate
- Barcode Reader
- Label Size
- Label Alignment
- Abort Move Status
- Auto Close
- SCSI Mode
- Post Rcvd Error
- Tape Alert Mode.

Chapter 3 - Operation

Drive Status Submenu

When you select either of the drives, the submenu in Figure 3-12 appears.

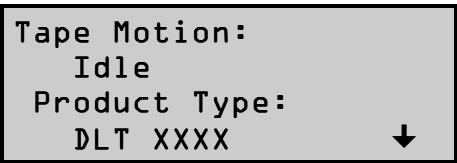


Figure 3-12 Drive Status Submenu

The characters designated XXXX show the drive model number. This screen is scrollable. The list of Drive Status categories available is as follows:

- Tape Motion
- Product Type
- Tape Format
- Compression
- SCSI Bus ID
- Drive Revision
- Controller Revision
- Cartridge Present
- Hardware Error
- Cleaning Needed
- Write Protected
- Operate Handle
- Serial Number.

Map Information Screen

The *Map Info* option of the Show Status Menu lets you review the status of each drive and each cartridge slot in the module. When you select Map Info, a screen similar to the one in Figure 3-13 appears:

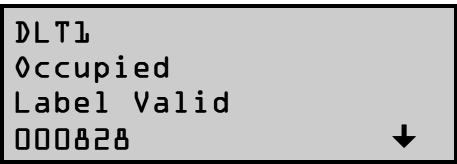


Figure 3-13 Map Info Submenu

Line 1 shows the current location. The ▲ and ▼ buttons let you scroll the following list of locations:

- DLT1
- DLT2
- Slot1
- Slot2
- Slot3
- Slot4
- Slot5
- Slot6
- Slot7
- Slot8
- Slot9
- Slot10.

Line 2 reports whether the location is *Empty* or *Occupied* by a cartridge. For each occupied location, line 3 reports the status of the bar code label. Line 3 displays either *Label Valid*, or *Label Not Present*.

For each location with a valid bar code label, line 4 displays up to eight of the encoded characters. If there is no label or bar code reader, line 4 displays *Label Not Present*.

Maintenance Menu

The Maintenance Menu and the options under it that are intended for operator use are described in *Chapter 4 - Maintenance*. Additional options on the Maintenance Menu that are intended for use by service personnel are described in the Service Manual.

Configure Menu

The Configure Menu how to use it and the options available under it are described in *Chapter 2 - Installation*.

Show History Menu

The Show History Menu enables the operator to review the history of the module. An example of the use of the Show History Menu appears later in this chapter under the heading ‘Displaying Error Logs.’ You can retrieve the configuration history, the original configuration, as well as statistics on the number of operations the library robotics and the drives have performed.

Security Menu

The Base Module *Security Menu* lets you lock the control panel. Locking prevents unwanted access to the Menu Mode, and takes the module off-line.

Note: The library can also be locked by the host computer software. Once so locked, the Security Menu can not override the host. You can display the Show Status Menu without unlocking the panel or taking the system off-line by pressing the **Escape** button at the Default Screen.

This option lets you specify a four-digit code that must be entered in order to access the library menus, including configuration. When you select the Set Unlock Code option, the following screen appears:

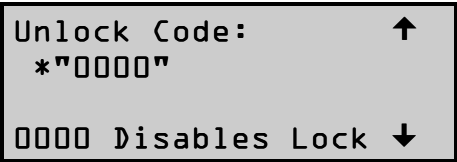


Figure 3-14 Code Select Submenu

The screen shows the default unlocked *0000* code. A cursor blinks beneath the first zero.

To enter a security code:

1. Use the ▲ and ▼ buttons to change the number to the value you want.
2. Press the **Enter** button to accept the value and move the cursor to the next digit.
3. Repeat steps 1 and 2 for the remaining digits.
4. When you've completed your code, press the **Escape** button. The screen shown in Figure 3-15 appears. Your code is shown in place of XXXX:

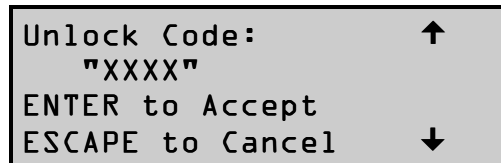


Figure 3-15 Code Accept Submenu

5. Press the **Enter** button to accept the code. (Once you've exited the Menu Mode, the next time you attempt to enter it, you will be asked to enter the security code.)

Note: Afterward, entering the default 0000 code unlocks the control panel. If you forget your unlock code, contact your technical support representative for assistance.

Displaying Firmware Revision

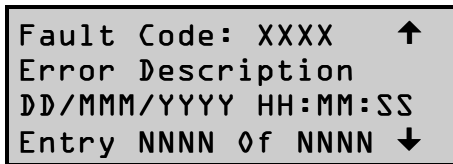
You may display the library robotics firmware revision at any time. It appears as one of the items on the Library Status submenu of the Show Status Menu. It is also displayed on line 2 of the POST Screen and the Initialization Screens.

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Displaying Error Logs

To display the error history of the module, use the Show History menu. Access it as follows.

1. At the Default Screen, press the **Enter** button to enter the Menu Mode. The Main Menu is displayed.
2. At the Main Menu, press the ▼ button four times until the ► in the display is next to *Show History Menu*.
3. Press the **Enter** button to select the submenu.
4. At the Show History Submenu, press the ▼ button once so that the ► in the display is next to *Error History*.
5. Press the **Enter** button to select the function. A circular list of 4-line error reports is displayed in the format shown in Figure 3-16:



```
Fault Code: XXXX  ↑
Error Description
DD/MMM/YYYY HH:MM:SS
Entry NNNN of NNNN ↓
```

Figure 3-16 Error History Screen

6. Using the ▼ and ▲ buttons, scroll the list to display the error history of the module.

Handling the Magazine

The 10-cartridge tape magazine must be removed from the module in order to insert or remove cartridges. **Note:** To insert or remove the magazine, the Magazine Security Lock must be unlocked, using the key supplied with the module. (Refer to Figure 3-17.) When the Magazine Security Lock is locked, the **Unlock/Open** button has no effect. If the module is installed in a reasonably secure environment, you may elect to leave the Magazine Security Lock in the unlocked position.

The host computer can enable or disable the **Unlock/Open** button using the SCSI Prevent Allow Medium Removal command. When you press the **Unlock/Open** button, the message *Magazine Locked* appears.

Important Note: When you enter the Menu Mode, the **Ready** light goes out. The magazine cannot be inserted or removed unless the **Ready** light is on. To remove the magazine when a failure prevents the Ready light from illuminating, see the paragraph headed 'Emergency Magazine Removal' later in this chapter.

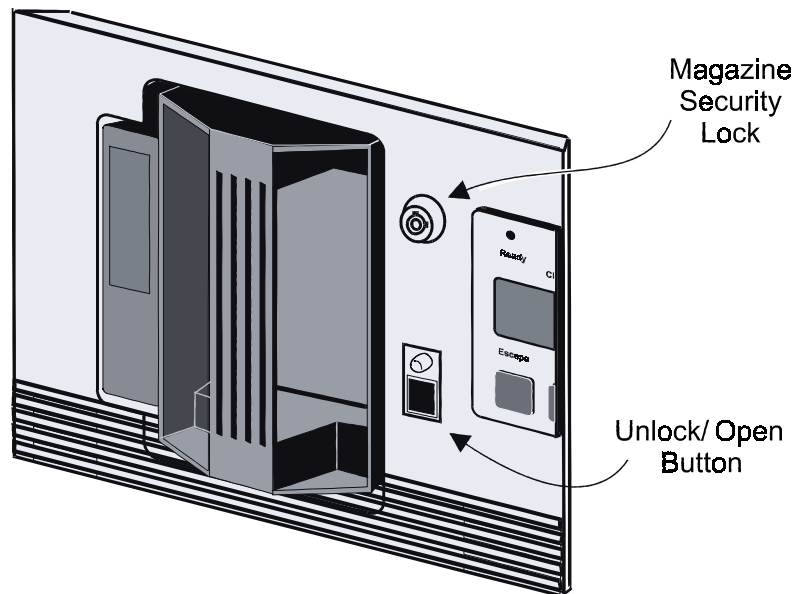


Figure 3-17 Magazine in Place

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Removing the Magazine

Whenever a magazine is in place inside the module it is locked in place to prevent tampering or accidental removal. To remove the magazine, the Default Screen must be displayed. Press the **Unlock/Open** button. The lock will release the magazine, permitting it to be pulled out. When the magazine has been removed from the module, the door closes and locks.

Emergency Magazine Removal

If a fault occurs that prevents removal of the magazine, turn the power off for five seconds. Power up while continuously pressing the **▲** button. Continue to hold the button until all of the indicators on the control panel light, then go out. Release the button. The magazine may now be removed.

Inserting a Magazine Into the Base Module

Note that the magazine door on the front of the module is closed and locked whenever there is no magazine installed. To open it, press the **Unlock/Open** button on the front panel. When the door has opened, slide the magazine through the door opening, with the cartridges protruding from the left. When the magazine is fully inserted, the lock mechanism automatically locks the magazine in place.

Inserting Cartridges Into the Magazine

Figure 3-18 shows a full magazine. Insert cartridges so that end with the write protect switch is outward, with the write protect switch toward the bottom of the magazine. If you choose to label your cartridges, place the labels on the same end as the write protect switch. Labels will likewise appear outward from the magazine when cartridges are correctly loaded.

After you've loaded the magazine, insert it into the library module in the orientation shown in Figure 3-18. Note that with the magazine handle toward you, the cartridges protrude to the left. The lowest numbered cartridge slot in the magazine is closest to the handle

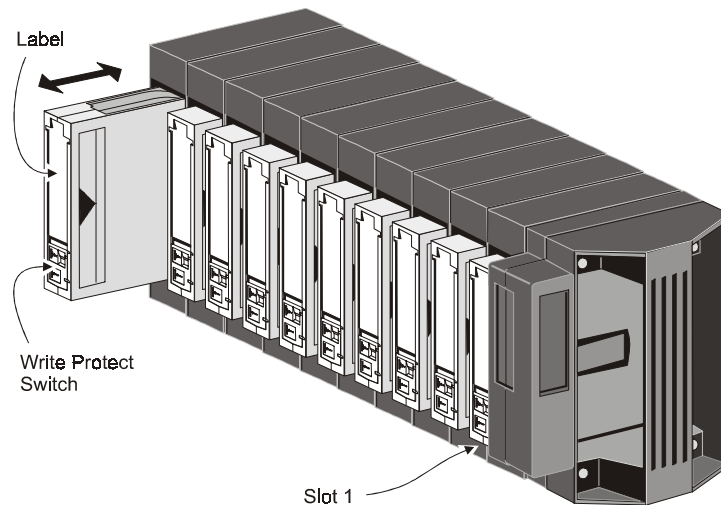


Figure 3-18 Tape Magazine with Cartridges Installed

Tape Requirements

The LibraryXpress uses ECMA-approved and ANSI proposed-standard DLTtape cartridges. The DLTtape cartridge is a four inch square plastic cartridge. DLTtape has been available in three types, each of varying length and capacity:

Table 3-2 Tape Specifications by DLT Type

DLTtape Type	Native Capacity	Head Passes	Tape Life	Tape Length (ft)
III	10 GB	500,000	20 Years	1100
IIIXT	15 GB	1,000,000	30 Years	1600
IV	20 GB (DLT4000) 35 GB (DLT7000)	1,000,000	30 Years	1800

The high density DLTtape IV cartridge is recommended for both the LXB7X10 and LXB4X10. To maintain interchangeability, both drives can read from and write to DLTtape III and DLTtape IIIXT.

Under average conditions of data compression, native capacity can be doubled. Actual compression will vary with file content.

Cartridge Handling and Storage

It is extremely important that you frequently examine your tape cartridges and be able to identify any that are potentially damaged or defective. Not only can such cartridges fail as storage media, but *damaged cartridges can also damage drives*.

Inspect all incoming shipments of cartridges. Reject the shipment if the container shows moisture or damage. Similarly reject any package contents that indicate moisture or impact damage.

Storing Cartridges

Store tapes vertically and in protective plastic containers. Store them where they will not be exposed to dust, high humidity, or direct sunlight.

Exposure to magnetic fields can erase data. Store your cartridges away from motors, audio speakers, x-ray equipment, etc.

If a DLTtape cartridge is dropped

Inspect the cartridge carefully before you insert it into a LibraryXpress magazine or any drive. Check the case for cracks, split seams, or distortion.

Shake the cartridge and listen. A rattle sound indicates a broken part inside. Don't use the cartridge.

Inspect the leader by opening the cartridge door as shown in Figure 3-19. The leader should be wound tightly to the spool. The leader loop should appear as shown below, protruding at a slight angle from the case.

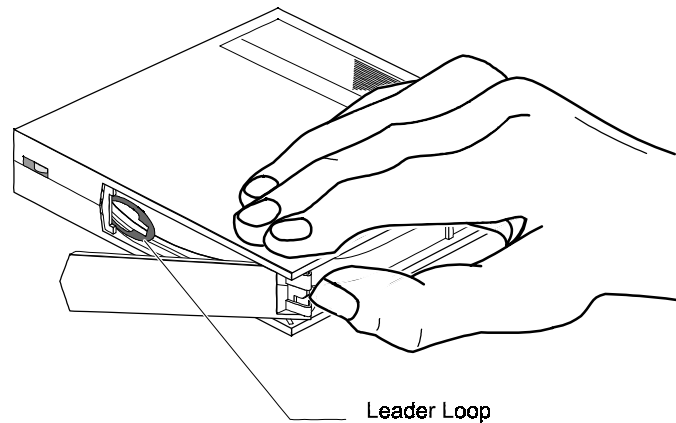


Figure 3-19 Inspecting Leader of DLTtape Cartridge

If the leader loop is torn, missing, or out of position, or if the tape leader is creased and loosely wrapped around the spool, do not use the cartridge.

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Inspect the toothed tape spool hub on the underside of the cartridge. The hub should seat precisely in the access opening. The hub is held in place by spring tension, and should deflect and bounce back freely. If the hub is rigidly jammed to the side or stuck down inside the body, the cartridge is broken. Do not use the cartridge!

Labeling Cartridges

- Place labels only in the recessed slot next to the write protection switch.
- Never place labels on the top, bottom sides or rear of the cartridge—they can cause loader faults and interfere with normal operations. Such labels can come off inside the equipment causing damage.
- Always inspect cartridges for incorrect or unintentionally attached labels.
- Never erase information on a cartridge label—always replace the label.
- Never write on a cartridge label with graphite pencils, water soluble felt pens, or any writing instrument that can leave behind tiny particles of debris.

Write Protection

Figure 3-20 shows the write protection switch of a DLTtape cartridge:

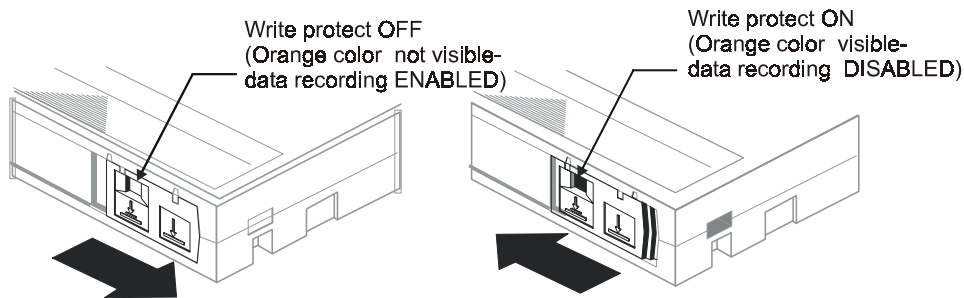


Figure 3-20 DLTtape Cartridge Write Protection Switch

To enable data recording, slide the write protect switch to the right so that no orange color is visible through the window in the write protect switch. To write protect the DLTape cartridge, slide the write protect switch to the left until the orange indicator shows through the window on the write protect switch.

Loading and Unloading Tapes

The Load/Unload menus enable you to specify a source and a destination for a cartridge movement. As a result, you use exactly the same procedure to load and unload. To load or unload a tape from the front panel of the module, use the Load/Unload menus as follows:



Figure 3-21 Default Screen

A default screen is shown in Figure 3-21. Note that DLT1 is empty, while DLT2 is idle. When a drive is idle, it has a cartridge loaded, and is awaiting instructions. From the Default Screen, enter the Menu Mode by pressing the **Enter** button. The Main Menu shown in Figure 3-22 appears.

Note: If the control panel has been locked by means of the Security Menu, the screen reports the locked status instead of displaying the Main Menu. If you do not know the unlock code, contact your system administrator.

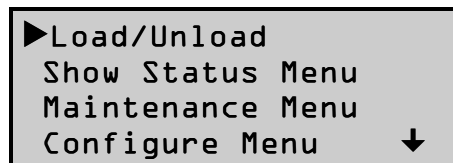


Figure 3-22 Main Menu

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The ► is next to the line that reads Load/Unload. Press the **Enter** button to display the first Load/Unload submenu, which is shown in Figure 3-23.

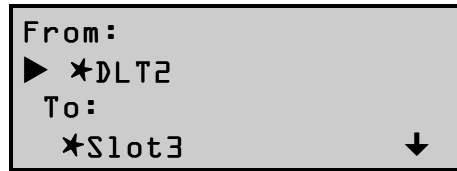


Figure 3-23 Load/Unload Initial Screen

In Figure 3-23, the ► is next to line 2 of the display. Line 2 shows the top item in a scrollable list of sources. Note that a ▼ has appeared on the right of the bottom line. This indicates that the ▼ button may now be used to scroll through the list, and that the top item on the list is displayed. As soon as you press the ▼ button, three things happen:

- The list scrolls down one item (only line 2 scrolls)
- An ↑ appears on the right of line 1 of the display. This indicates that there is one or more items above the item displayed on line 2.
- The ★ at the left of line 2 disappears. This is because the ★ indicates the current selection, which you have scrolled offscreen, and you haven't yet selected a different item from the list.

Note: The contents of the lists on line 2 and line 4 will vary as follows.

Initial Screen - ‘From’ Line

The list on line 2 in Figure 3-23 (the *From* line) will include every drive and every magazine slot that has a cartridge in it (you can’t get a cartridge from a slot or drive that is empty).

Initial Screen - ‘To’ Line

The list on line 4 of Figure 3-23 (the *To* line) will include all of the valid destination choices, that is, drives and slots that are empty (you can’t put a cartridge into a slot or drive which already has one in it.)

Scroll List - ‘To’ Line

There is another limitation on the ‘To’ list. If you have selected a drive on the ‘From’ screen, the ‘To’ list can include only slots. If you have selected a slot on the ‘From’ screen, the ‘To’ list can contain only drives.

Let us assume that you want to load the cartridge that is in Slot 4 into any available drive. Use the ▼ button to scroll line two to Slot 4. The display appears as shown in Figure 3-24.

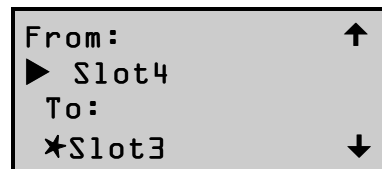


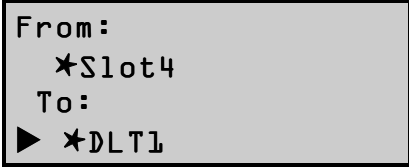
Figure 3-24 Load/Unload ‘From’ Entry Screen

When you have scrolled to your desired source, press the **Enter** button to select it. Notice that in Figure 3-25, two changes occur in the display.

- The ★ reappears at the beginning of line 2, indicating that you have made a selection.

Chapter 3 - Operation

The ► now moves to line 4, indicating that you may now select a destination.

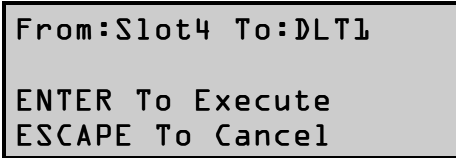


```
From:
  ★Slot4
To:
  ► ★DLT1
```

Figure 3-25 Load/Unload 'To' Entry Screen

You can now simply press the **Enter** button to select DLT1 as the destination. Note that there is no ↑ at the end of line 1. There are no additional choices because you have selected a slot as the source, so the destination must be a drive.

Press the **Enter** button to select DLT1. In response, the confirmation screen in Figure 3-26 appears.

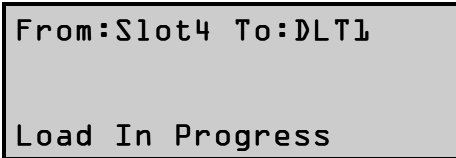


```
From:Slot4 To:DLT1
ENTER To Execute
ESCAPE To Cancel
```

Figure 3-26 Confirmation Screen

As the confirmation screen indicates, to execute the load or unload, press the **Enter** button. If the confirmation screen does not show your intended source and destination, press the **Escape** button to return to the *From* entry screen.

When you press the **Enter** button, the screen shown in Figure 3-27 appears. If the source is a drive, the word *Unload* appears in place of the word *Load* on line 4.



```
From:Slot4 To:DLT1
Load In Progress
```

Figure 3-27 Load/Unload 'In Progress' Screen

When the load or unload operation is finished, the Default Screen reappears. As illustrated in Figure 3-28, the screen has been updated to show that there is now a cartridge in DLT1 and that Slot 4 is empty.

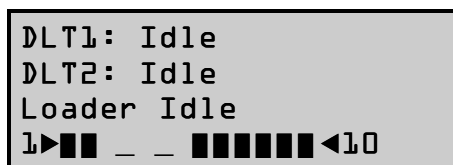


Figure 3-28 Updated Default Screen

Chapter 4 - Maintenance

The only regular maintenance task that should be periodically performed is to run/replace the cleaning cartridge. There are User Diagnostics on the Demo submenu that you can use to check the operation of the Base Module. Occasionally, new firmware is issued by Overland Data. Firmware upgrades must be performed by qualified service personnel.

The Maintenance Menu offers the following options:

- Clean Drive
- Diagnostic Menu
- Demo Menu
- Flash Update
- Novram Update
- Clock Update
- Flash DLT
- Reboot Module.

Of these, only Clean Drive, Demo Menu, and Reboot Module are intended for the user. This chapter tells you how to clean the drives. The Demo Menu is described in *Chapter 5 - Troubleshooting*.

Using the Cleaning Cartridge

The cleaning cartridge is similar in appearance to the cartridge shown in Figure 3-18. The command to run the cartridge is issued from the control panel. The procedures that follow tell you how to install a cleaning cartridge, how to clean a drive, and how to remove the cleaning cartridge.

Chapter 4 - Maintenance

Using the Autoclean Feature

In the Configuration Options, the Set Autoclean Mode setting allows you to enable an automatic cleaning cycle which operates as part of the cartridge unload sequence whenever the Use Cleaner LED comes on. To use this option, you must reserve a slot for a cleaning cartridge using the Reserve Slots option. The default is Disabled.

Note: The cleaning cartridge is abrasive, and should not be used unless the **Use Cleaner** LED comes on. To determine which drive requires cleaning, unload both drives and select 'Cleaning Needed' on the Drive Status submenu.

Installing a Cleaning Cartridge

1. Examine the Default Screen on the Control Panel to determine whether any cartridges are loaded into the drives. If so, then unload each as described in *Chapter 3 - Operation*.
2. Using the key provided (if necessary), unlock the Magazine Security Lock on the front panel.
3. Press the **Unlock/Open** Button on the front panel.
4. Remove the magazine from the Base Module.
5. Remove any cartridge present in Slot 1 (the slot nearest the handle).
6. Insert the cleaning cartridge into Slot 1. You can use any slot, but using Slot 1 saves some keystrokes.
7. Press the **Unlock/Open** button on the front panel.
8. Insert the magazine into the Base Module.

You can also dedicate a slot for a cleaning cartridge by using the *Reserved Slots* Configuration option. When you set reserved slots to "1," slot 10 is dedicated as a cleaning slot. You can dedicate additional reserved slots.

Note: As illustrated below, ordinary cartridge slots are numbered from the front of the magazine to the rear. If there is one reserved slot it is the last slot in the magazine (position 10). If there is more than one reserved slot, reserved slot #1 will follow the last data cartridge slot as shown in Figure 4-1. This also applies to the numbering of the cleaning slots when the reserved slots contain cleaning cartridges:

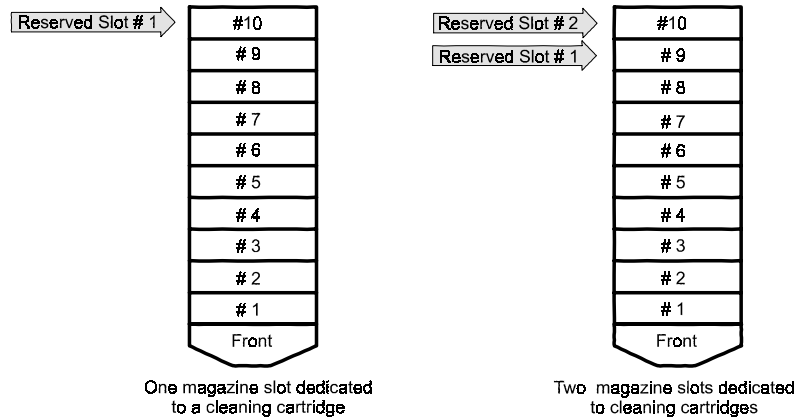


Figure 4-1 Reserved Slot Numbering

Running the Cleaning Cartridge

This procedure assumes that the cleaning cartridge has been installed into Slot 1 of the magazine.

1. At the Default Screen, press the **Enter** button. The display will show the following:

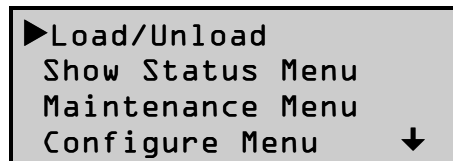


Figure 4-2 Main Menu

Chapter 4 - Maintenance

2. Press the ▼ button twice to move the ► next to Maintenance, then press the **Enter** button to select the Maintenance Menu. The display will show something similar to the following.

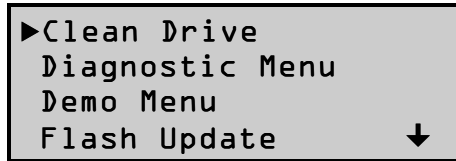


Figure 4-3 Maintenance Submenu

3. Press the **Enter** button once to select Clean Drive.

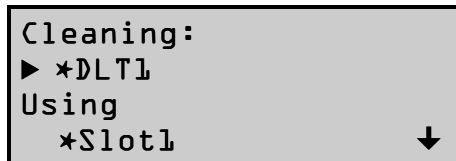


Figure 4-4 Cleaning Submenu

4. Lines 2 and 4 are scrollable. The choices available on Line 2 are DLT1, DLT2 and All Drives. Let us assume you want to clean DLT1. Press the **Enter** button once to accept DLT1. The ► moves to line 4 of the display. Press the **Enter** button again to use the cartridge in Slot 1.

Note: If you are unable to use slot 1 for the cleaning cartridge, you can scroll line 4 to select another slot.

5. The Clean Confirmation Screen appears, as shown below:

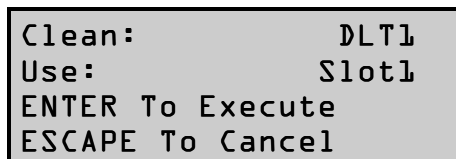


Figure 4-5 Cleaning Confirmation Screen

6. As the confirmation screen indicates, to execute the cleaning operation, press the **Enter** button. If the confirmation screen does not show your intended drive and cleaning cartridge, press the **Escape** button to return to the Cleaning submenu.

When you press the **Enter** button, the In Progress screen appears.

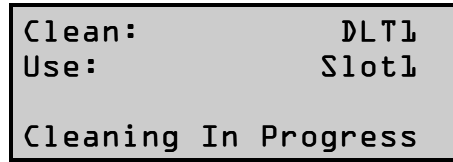


Figure 4-6 Cleaning In Progress Screen

When the cleaning operation is completed, the Default Screen reappears.

Removing the Cleaning Cartridge

Note: If the Base Module is installed in a sufficiently secure area, you may elect not to use the Magazine Security Lock. In that event, leave the lock in the unlocked position

1. Examine the Default Screen on the Control Panel to determine whether any cartridges are loaded into the drives. If so, then unload each using the Load/Unload Menu, as described in *Chapter 3 - Operation*.
2. Using the key provided (if necessary), Unlock the Magazine Security Lock on the front panel.
3. Press the **Unlock/Open** Button on the front panel.
4. Remove the magazine from the Base Module.
5. Remove the cleaning cartridge from the magazine.
6. Insert any desired data cartridge into the slot vacated by the cleaning cartridge.
7. Press the **Unlock/Open** Button on the front panel.
8. Insert the magazine into the Base Module.
9. Using the key provided, lock the Magazine Security Lock on the front panel (optional).

Chapter 5 - Troubleshooting

Diagnosing Problems

There are two main types of problems that can cause the Base Module to malfunction or fail to perform correctly: platform problems and general drive errors. Some errors cause Fault Symptom Codes (FSC) to appear on the control panel display, along with a description of the fault. The FSC codes are described later in this chapter.

Platform Problems

These errors arise out of incorrect installation and configuration. The most common characteristic of this type of error is that the Base Module appears to operate normally, except that no data can be interchanged. You may not get an error code on the control panel. To identify an error as this type of problem, check your installation and configuration setup, referring back to *Chapter 2 - Installation*.

General Drive Errors

These errors usually result from a miscommunication between the controller and drive processors or involve a mechanical malfunction. In most cases, these types of errors report an error message and an FSC to the control panel. The only exceptions are power supply problems and display malfunctions. The FSC can be used to determine a recovery procedure.

Some error messages can be cleared by pressing the **Enter** button on the control panel, others by cycling the power to the module. Often the module will resume normal operation. Other errors are repeated when the operation is attempted again. Such recurrent errors may require more extensive recovery procedures such as replacement of a part.

To aid you in localizing persistent errors, there are user diagnostics available on the Demo Submenu. These are described at the end of this chapter.

Error Recovery

The flow chart in Figure 5-1 outlines the recommended steps for error recovery. This chart should be followed in all cases. Error Recovery Procedures (ERP) are available for some Fault Symptom Codes (FSC). Fault Symptom Codes are listed in Table 5-1.

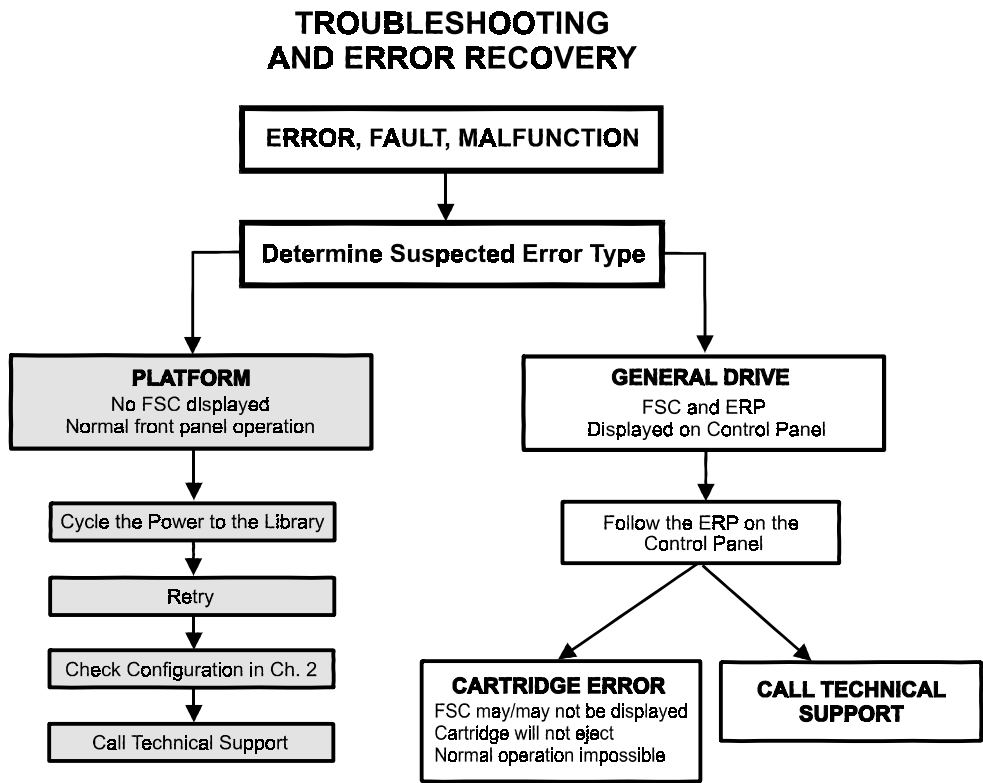


Figure 5-1 Troubleshooting Flow Chart

Fault Symptom Codes (FSC)

Fault Symptom Codes appear in the Fault Screen described in *Chapter 3 - Operation*. Each FSC is accompanied by a descriptive message and instructions for clearing the fault. When a fault persists, you should look up the FSC in Table 5-1 for a description of the error code. If you call your Technical Support representative about a fault condition, be sure to furnish the FSC to aid in identifying the problem.

Table 5-1 Fault Symptom Codes

System Error Codes (0xxx)

FSC	Message	Description
0101	Unused Interrupt	An undefined interrupt occurred
0102	Enqueue'g a Null Ptr	A NULL pointer was passed to one of the enqueueing functions. Generally a firmware bug.
0103	Invalid Cmd Rec'd	An illegal trace command was received by the trace process.
0201	Trc. Comm Open Error	The trace port could not be opened.
0301	Novram Init. Error	A failure occurred when trying to initialize the Novram.
0302	Novram Chksum Error	A checksum error was detected while reading the Novram.
0303	Novram Program Error	A problem was detected while trying to update the Novram.
0304	Novram Downld. Error	An error was detected while trying to download configuration data.
0305	Novram Data Error	An error was detected while trying to validate the Novram.
0306	Novram Update Error	A problem was detected while trying to update the Novram.
0401	Invalid Display Char	Indicates a problem in the LCD display routines.
0402	Invalid Display Line	Indicates a problem in the LCD display routines.

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FSC	Message	Description
0501	Barcode Comm. Error	The barcode comm port could not be opened.
0601	Clock Init. Error	The real-time clock could not be initialized.
0602	LP-RAM Init. Error	An error occurred in the low-power ram initialization.
0603	Clock Download Error	An error occurred while downloading real-time clock information.
0701	Slv. Comm Open Error	Failed to open a Slave comm port.

SCSI Error Codes (1xxx)

FSC	Message	Description
1001	SCSI Firmware Error	
1002	SCSI FIFO Empty	While getting SCSI command bytes, the SCSI chip reported an empty FIFO before it was expected.
1003	SCSI FIFO Error	While getting SCSI command bytes, the SCSI chip reported that the FIFO was not empty when it should be empty.
1004	SCSI Gross Error	Gross error status was returned by the SCSI chip. This usually means that the SCSI chip is in an illegal state.
1005	Illegal SCSI Cnt Cmd	The SCSI chip rejected a command from the firmware.
1006	SCSI Message Error	Not reported.
1007	SCSI Invalid Element	Firmware error.
1008	SCSI No Pending Int	An interrupt was returned from the SCSI chip when one was not expected.
1009	SCSI Invalid Int	An invalid interrupt was returned from the SCSI chip.
1020	No Active Command	Status was returned from the control process when no command was active.
1021	SCSI Invalid Request	An invalid request was received from the control process (firmware error).
1022	SCSI Invalid Semaphore	Firmware Error.
1023	SCSI Invalid State	Firmware Error.
1024	SCSI Invalid Ctl Msg	A message sent from the control process was not valid.
1025	Overlapped Ctl Cmds	The control process sent a command while one was in process.
1026	Overlapped Ctl Msgs	The control process sent a message while one was in process.
1030	Invalid SCSI ID	The SCSI ID in NOVRAM is set to ≥ 8 and the PWB is not configured for Wide SCSI. Would only occur during SCSI initialization.

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Control Error Codes (2xxx)

FSC	Message	Description
2001	Ctl. Invalid Command	An invalid command was received by the control process.
2002	Undefined Config	An unsupported configuration was detected.
2003	Invalid Drive State	One of the DLT drives was in an invalid state. This is caused by either attempting to fetch a cartridge from an empty drive, or stowing to a drive that already has a cartridge loaded.
2004	Loader Not Ready	Currently not displayed.
2005	SCSI Id Not Set	An attempt to set the DLT SCSI id failed.
2006	DLT Comm. Open Error	An attempt to open a COM port failed.
2007	Door Fault	An error occurred while attempting to move the door.
2008	Illegal Move	While attempting to perform a MOVE operation, the source or destination locations were in the wrong state (FULL or EMPTY). This also occurs if the MOVE is attempted with an invalid cartridge map.
2009	Door Open	A command was received while the door was open.
200A	Menu Mode	A command was received while the unit was in Menu mode.
200C	Cart Unaccessible	An attempt was made to fetch a cartridge from a drive that is not in the unloaded state. This only applies when the system is configured for explicit unloads.
200D	Drive In Error	An attempt was made to access a drive which is in an error state.
200E	No Magazine	The element is not available because the magazine is not installed.
2010	Ctl. Firmware Error	An invalid configuration was detected. The configuration jumpers on the main board may not be set properly.

FSC	Message	Description
2011	Ctl. Firmware Error	A status block was received by the Control Process operating in a Stand-Alone or Slave configuration. Since commands are never sent in these modes, status cannot be received.
2012	Ctl. Firmware Error	A command was received which was invalid for the current configuration.
2013	Ctl. Firmware Error	
2014	Ctl. Firmware Error	
2015	Ctl. Firmware Error	
2016	Ctl. Firmware Error	
2030	DLT Timeout Error	During powerup, communication with one of the DLT drives was unsuccessful.
2031	DLT Timeout Error	While trying to update the front panel, communication with one of the DLT drives was unsuccessful.
2032	DLT Timeout Error	Communication with DLT drive 1 was unsuccessful (sequential mode).
2033	DLT Timeout Error	Communication with DLT drive 2 was unsuccessful (sequential mode).
2034	DLT Timeout Error	While attempting to update the cartridge map, communication with one of the DLT drives was unsuccessful.
204x	Invalid Ctl Msg	An illegal message type code was received. This can be the result of receiving a NULL type code, a status code without a command being active, or a command code while a command is currently active.

Chapter 5 - Troubleshooting

Control Error Codes (2xxx) continued...

FSC	Message	Description
205x	No Free Queues	The system could not allocate a free queue.
206x	Calib. Error Port x	When trying to locate the unit attached to port x, the pass-thru elevator reached the top of rail.
206F	Pass-thru Init Error	The pass-thru elevator did not travel a minimum distance to reach the top of its travel.
2070	Command Timeout	Enter to reboot. The 10-minute timer was exceeded when trying to fetch from a drive.
2071	Command Timeout	Internal error only. Not reported to the operator or host.
2072	Command Timeout	Power Down, Wait 30 seconds, Power Up. Occurs if the power is cycled too quickly and the DLT drive comes up in an error state and doesn't communicate with the library controller.
2073	Drive Config Error	Set if the Alternate Unload has not been selected. This currently applies only to DLT7000s with a controller microcode revision greater than 50.
2075	Fetch Error	During a remote fetch operation, the remote unit returned an error.

Motor Process Error Codes (3xxx)

FSC	Message	Description
3001	Picker Retries Exceeded	See FSC 3010 through 3014.
3002	Picker Tach Errors	TACH errors were detected during a picker movement.
3003	Elevator Tach Errors	TACH errors were detected during an elevator movement.
3004	Elevator Init Error	An elevator jam was detected during initialization.
3006	Passthru Tach Errors	TACH errors were detected during pass-thru elevator movement.
3007	DLT Timeout Error	Communication with one of the DLT drives was unsuccessful. A command was issued but status was not returned.
3008	Invalid Drive State	Currently unused.
3009	Door Tach Errors	TACH errors were detected during a door movement.
300A	Door Fault	During initialization, the door was found to be in an improper state.
300B	Elev Open Tach	Open Tach detected on elevator motor.
300C	Picker Open Tach	Open Tach detected on picker motor.
300D	Door Open Tach	Open Tach detected on door motor.
300E	Drive Stow Error	A problem was encountered while trying to stow a cartridge to a drive. Couldn't close the door.
3010	Picker Retries Exceeded	While attempting to fetch a cartridge, the picker was not able position properly within 16 attempts.
3011	Picker Retries Exceeded	While attempting to fetch a cartridge, the picker was not able position properly within 16 attempts.
3012	Picker Retries Exceeded	While attempting to fetch a cartridge, the picker was not able position properly within 16 attempts.

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FSC	Message	Description
3013	Picker Retries Exceeded	While attempting to fetch a cartridge, the picker was not able position properly within 16 attempts.
3014	Picker Retries Exceeded	While stowing to a drive, the initial push failed.
3020	Undefined Config	An unsupported configuration was detected.
3040	Motor Firmware Error	An undefined picker position was specified.
3042	Motor Firmware Error	An undefined door position was specified.
3100	Picker Jammed	The picker stalled during an inventory.
3101	Picker Jammed	During a stow operation, the picker was not able to insert the cartridge into the bin.
3102	Picker Jammed	While stowing to a bin, the picker moved too far. This generally occurs if the arm slips in between two cartridges during the final push.
3103	Picker Jammed	While stowing to a bin, the picker moved too far. This generally occurs if the arm slips in between two cartridges during the final push.
3104	Picker Jammed	During a bin stow, the picker did not reach a position far enough to insure that the cartridge was fully inserted.
3105	Picker Jammed	The picker was not able to home properly after stowing a cartridge to a bin.
3106	Picker Jammed	The picker was not able to position to the cartridge notch while performing a bin fetch operation.
3107	Picker Jammed	During a bin fetch, the picker stalled while attempting to pull a cartridge into the shuttle.

Motor Process Error Codes (3xxx) continued...

FSC	Message	Description
3108	Picker Jammed	The picker stalled while fetching from a bin.
3109	Picker Jammed	The picker was not able to position to the cartridge notch while performing a drive fetch operation.
310A	Picker Jammed	During a drive fetch, the picker stalled while attempting to pull a cartridge into the shuttle.
310B	Picker Jammed	During a stow operation, the picker was not able to insert the cartridge into the drive.
3200	Elevator Jammed	The elevator was not able to position properly while attempting to recover an orphaned cartridge.
3201	Elevator Jammed	The elevator was not able to position properly during an inventory.
3202	Elevator Jammed	The elevator was not able to position properly during a fetch operation.
3203	Elevator Jammed	The elevator was not able to position properly during a stow operation.
3204	Elevator Jammed	The elevator was not able to position properly during a home operation.
3205	Elevator Jammed	The elevator stalled while attempting to open the DLT door.
3300	Passthru Jammed	The pass-thru elevator was not able to position properly.

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Power-On Error Codes (4xxx)

FSC	Message	Description
4001	Rom CRC Error	
4002	Ram Test Failed	
4003	Xilinx Progr. Error	
4010	Comm. Uart Error	
4011	Trace Uart Error	
4012	Barcode Uart Error	
4013	DLT 1 Uart Error	
4014	DLT 2 Uart Error	

Menu Error Codes (5xxx)

FSC	Message	Description
5001	No DLTs Attached	User has chosen the Load/Unload menu selection, but no DLT drives are currently attached to the Library.
5002	All DLTs/Slots Empty	User has chosen the Load/Unload menu selection, but all drive and slot locations are currently devoid of tape cartridges.
5003	All DLTs/Slots Full	User has chosen the Load/Unload menu selection, but all drive and slot locations are currently occupied with tape cartridges.
5010	No DLTs Attached	User has chosen the Clean Drive menu selection, but no DLT drives are currently attached to the Library.
5011	All Slots Empty	User has chosen the Clean Drive menu selection, but all slot locations are currently devoid of tape cartridges.
5012	All DLTs Full	User has chosen the Clean Drive menu selection, but all DLT drive locations are currently occupied with tape cartridges.
5013	DLT Timeout Error	A DLT, previously determined at boot-up to be attached, has not responded to a communication attempt.
5014	DLT Already Loaded	User has chosen the Clean Drive menu selection, but a DLT previously determined to be unloaded and now selected to be cleaned, has indicated the presence of a tape cartridge.
5015	Expired Cleaning Cart	User has chosen the Clean Drive menu selection, but has specified a slot which contains an expired cleaning cartridge.
5016	Not a Cleaning Cart	User has chosen the Clean Drive menu selection, but has specified a slot which does not contain a cleaning cartridge.
5017	No Slots Installed	

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FSC	Message	Description
5020	All DLTs/Slots Empty	User has chosen the Label Info menu selection, but all drive and slot locations are currently devoid of tape cartridges.
5021	Bad Cartridge Map	
5030	Bad Novram Setting	A setting restored from Novram, which successfully passed the Novram checksum verification performed at power-up, nevertheless was determined to be invalid.
5031	Bad Calendar Setting	A time or date setting obtained from the Real Time Clock, indicated as “running,” but determined to be invalid.
5032	Bad Setting	A default setting was determined to be invalid.
5033	Set Density Failed	User has chosen the DLT Density menu selection, but the chosen DLT has failed to successfully execute the density change request.
5034	Set Compression Failed	User has chosen the DLT Compression menu selection, but the chosen DLT has failed to successfully execute the compression mode change request.
5035	DLT Timeout Error	Drive communication error during a menu operation.
5036	DLT Timeout Error	Drive communication error during a menu operation.
5037	DLT Set Bus ID Error	Error returned from drive when trying to set a SCSI ID with the configure menu.
5038	SCSI Lock Overrides	Display message only if an attempt is made to remove a magazine while a Prevent Medium removal is in effect.
5039	Invalid Unlock Code	Display message only when an invalid unlock code is entered.
503A	Auto Cleaning	Display message only -not an error.
5090	Slave Command Failure	Error occurred sending a menu mode command to a slave module.

Inter-module Error Codes (6xxx)

FSC	Message	Description
6001	Comm Port Open Error	An attempt to open the RS-232 serial communication port used by the inter-module processes failed.
6002	Comm Port Send Error	An inter-module process (Master or Slave) was sending a packet to a remote module, but the UART detected an error condition during the transfer.
6003	Comm Port Recv Error	An inter-module process (Master or Slave) was receiving a packet from a remote module, but the UART detected an error condition during the transfer.
6004	EnQ Without IDs	
6005	DeQ Without Ids	
6006	EnQ Null Pointer	
6007	No Free Comm Blks	
6010	Pkt Send Error	The Master inter-module process has repeatedly attempted to send a packet to a Slave inter-module process, but all retries have been exhausted before the packet could be successfully sent.
6011	Pkt Receive Error	The Master inter-module process has repeatedly attempted to receive a packet from a Slave inter-module process, but all retries have been exhausted before the packet could be successfully received.
6012	Status Unexpected	The Master inter-module process received a Status packet, but no Command is currently active.
6013	Invalid Com Blk Type	The Master inter-module process received a packet from a Slave inter-module process, but the packet's CommBlock type was invalid.
6014	Invalid Com Blk Type	The Master inter-module process received

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FSC	Message	Description
		a packet from the Command/Message queue, but the packet's CommBlock type was invalid.
6015	Ack Timeout - Out	The Master inter-module process attempted to initiate a packet transmission to a Slave inter-module process, but a timeout occurred waiting for the Slave's acknowledge.
6016	Ack Timeout - In	The Master inter-module process attempted to initiate a packet transmission from a Slave inter-module process, but a timeout occurred waiting for the Slave's acknowledge.
6017	Ack Invalid - Out	The Master inter-module process attempted to initiate a packet transmission to a Slave inter-module process, but the Slave's acknowledge was invalid.
6018	Ack Invalid - In	The Master inter-module process attempted to initiate a packet transmission from a Slave inter-module process, but the Slave's acknowledge was invalid.
6019	Comm Port Ack Error	The Master inter-module process, after sending a control byte to a Slave, was waiting for an acknowledge, but the UART detected an error condition.
6020	Command Overlap	The Master inter-module process received a Command from the Master control process, but a previously issued command is still being executed.
6021	Slave RTS Still Set	The Master inter-module process has received a valid acknowledge from a Slave, but the Slave's RTS line has remained asserted.
6022	Slave Addr Invalid	The Master inter-module process received a CommBlock from the Master control process, but the specified Slave address exceeds the maximum valid range.

FSC	Message	Description
6023	Slave Req Unknown	The Master inter-module process detected an active SRVREQ line, but, after sequencing through all slave addresses, determined that no Slave had its RTS line asserted.
6024	Slave Has No Pkts	The Master inter-module process is requesting the Slave to send a packet, but the Slave has no packets to send.
6025	Pkt ID Invalid	
6026	No Slaves to Flash	
6027	Master Has No Flash	
6028	Slave Unavailable	
6029	Slave Has No Flash	
6030	Slave Dev. Incompat.	
6031	Slave Boot Incompat.	
6032	Slave Main Flash Err	
6033	Slave Boot Flash Err	
6034	Slave Re-boot Failed	
6035	Slave Update Err	
6036	Invalid Image Size	
6037	Command Timeout	
6040	Pkt Send Error	A Slave inter-module process has repeatedly attempted to send a packet to the Master inter-module process, but all retries have been exhausted before the packet could be successfully sent.
6041	Pkt Receive Error	A Slave inter-module process has repeatedly attempted to receive a packet from the Master inter-module process, but all retries have been exhausted before the packet could be successfully received.
6042	Status Unexpected	A Slave inter-module process received a Status packet, but no Command is currently active.
6043	Invalid Com Blk Type	A Slave inter-module process received a

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FSC	Message	Description
		packet from the Master inter-module process, but the packet's CommBlock type was invalid.
6044	Invalid Com Blk Type	A Slave inter-module process received a packet from the Status/Message queue, but the packet's CommBlock type was invalid.
6045	Command Overlap	A Slave inter-module process received a Command from the Master inter-module process, but a previously issued command is still being executed.
6046	No Pkts to Send	A Slave inter-module process has been requested to send a packet to the Master inter-module process, but the Slave inter-module process has no packets to send.
6047	Invalid Direction	A Slave inter-module process has received a direction control byte from the Master inter-module process, but the direction control byte is invalid.
6048	Master Pkt ID Bad	

Boot Error Codes (Bxxx)

FSC	Message	Description
B001	Boot ROM CRC Error	
B002	Boot RAM Test Failed	
B004	Boot Comm Open Error	
B005	Boot Novram Error	
B006	Boot Unused Int.	
B007	Flash Init. Error	
B010	Boot UART 0 Error	
B011	Boot UART 1 Error	
B012	Boot UART 2 Error	
B013	Boot UART 3 Error	
B014	Boot UART 4 Error	

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Flash Error Codes (Fxxx)

FSC	Message	Description
F001	No Flash Installed	
F002	Invalid Comm Port	
F003	Could Not Open Comm	
F004	Host Sync Failed	
F005	Invalid H/W Config	
F006	Incompatible Image	
F010	Flash Erase Error	
F011	Flash Download Error	
F012	Flash Program Error	
F013	Flash CRC Error	

* If you do not know the unlock code, contact your System Administrator.
If an error message is displayed that is not included in Table 5-1, please write down the fault code number and follow the recovery procedure described on line 4 of the display. If the same error occurs again, call your technical support representative.

Using the Demo Submenu

The Demo submenu on the Maintenance Menu lists five demos, numbered 1 through 5. At present, only Demo 1 is implemented. Demo 1 enables the user to fully exercise the library robotics.

When you select Demo 1, the library robotics begin to move cartridges randomly from slot to slot in the Base Module, while reporting on the front panel the number of passes. If all slots in the magazine are full, Demo 1 will load a cartridge into DLT1 and leave it there. If you press the ▲ button while Demo 1 is running, the Base Module will load a cartridge into DLT1, unless DLT1 is full. If you press the ▲ button again, the cartridge is unloaded from DLT1 and returned to the magazine. The ▼ button causes DLT2 to be loaded and unloaded in the same way.

Demo 1 will run continuously as long as the Base Module has power. To stop the test, press the **Escape** button. A flashing message appears on the display telling you that the test is paused. Pressing the **Escape** button a second time terminates Demo 1 and returns to the Maintenance Menu.

Appendix A - Specifications

Operational Performance Specifications

Host Interface	Fast SCSI-2 (DLT4000), Wide/Fast SCSI-2 (DLT7000)
Number of Cartridges, Full Magazine	10
Media type	
LXB4110, 4210.....	DLTtape IV
LXB7110, 7210.....	DLTtape IV
Number of Drives	1 or 2
Tape Speed.....	110 in/sec read/write, 150 in/sec search
Tape Tension	3.0 +/- 1 oz. when stationary
.....	4.7 +/- 1 oz. at operating speed
Load Time	10 sec (max.), including picking from slot
Unload Time.....	10 sec (max.), including returning to slot
Rewind Time	45 sec (avg.)
Sustained native data transfer rate, maximum	
LXB4110, 4210.....	1.5 MB/sec
LXB7110, 7210.....	5.0 MB/sec
*GB/hour rates are nominal and may vary due to site-specific factors.	
Peak SCSI transfer rate, synchronous mode	
LXB4110, 4210.....	10.0 MB/sec
LXB7110, 7210.....	20.0 MB/sec
Module Native Data Capacity (Full Magazine):	
LXB4110, 4210.....	200 GB
LXB7110, 7210.....	350 GB

Reliability Specifications (Drives)

Mean cycles between operator intervention	150,000
Data Error Rate	1 x 10 ¹⁷ bits read
MTBF.....	280,000 hrs (unlimited duty cycle)
MTTR	30 min
Head Life DLT4000	10,000 tape motion hrs
Head Life DLT7000	30,000 tape motion hrs
Design Life	5 years @ 3,300 power-on hrs/year

Reliability Specifications (Library Robotics)

Life Expectancy, Load/Unload Operations.....	1,500,000
Design Life	Seven years

Appendix A - Specifications

Power Specifications

Voltage.....	115-240 VAC
Amperage	1.8-1.2 A
Line Frequency	50-60 Hertz

Mechanical Specifications

Height.....	6.97 in. (17.78 cm.)
Width.....	17.00 in. (43.12 cm.)
Depth	
overall	23.75 in. (60.35 cm.)
behind panel	22.75 in. (57.79 cm.)
Weight	
dual drive	62 lbs. (28.18 kg.)
single drive.....	48 lbs. (21.8 kg.)
Shipping Weight	
dual drive	70 lbs. (31.81 kg.)
single drive.....	56 lbs. (25.45 kg.)

Environmental Specifications

Operating

Dry Bulb Temp.	50°F to 104°F (10°C to 40°C)
Temperature Gradient	1.8°F/min. (1°C/min.)
Temperature Shock	59°F (15°C) over 2 min.
Wet Bulb Temperature	78.8°F (26°C)
Relative Humidity <small>non-condensing</small>	15% to 85%
Humidity Gradient	10%/hour
Altitude	-100ft. to +10,000 ft (-305m to 3050m)

Non-Operating (Packed or Unpacked)

Dry Bulb Temp.	-40°F to 140°F (-40°C to 60°C)
Temp. Gradient.....	36°F (20°C)/hour (across the range)
Temperature Shock	27°F (15°C) (over 2 min.)
Wet Bulb Temp.	86°F (30°C)
Relative Humidity <small>non-condensing</small>	10% to 95%
Humidity Gradient	10%/hour
Altitude	-100 to +10,000 ft. (-30.5 to +3050m)

Storage/Transit

Dry Bulb Temp.	-40°F to 140°F (-40°C to 60°C)
Temp. Gradient.....	45°F (25°C)/hour (across the range)
Temperature Shock	27°F (15°C) (over 2 min.)
Wet Bulb Temp.	86°F (30°C)
Relative Humidity <small>non-condensing</small>	5% to 95%
Humidity Gradient	10%/hour
Altitude	-100 to +10,000 ft. (-30.5 to +3050m)

Acoustic Emissions

Drive Condition	Emission Level
Both drives operating	<50 dBA
(Intermittent robot motion excepted)	

Safety

The LXB4110, 4210 and LXB7110, 7210 carry the following Regulatory Agency product safety certifications:	
Certification	Standard
UL Listed	UL 1950
TUV/Product Service.....	EN 60 950
GS Mark	
CE Mark	EMC Directive
.....	Low Voltage Directive
Canadian UL Listed.....	CSA 22.2 No. 950

Electromagnetic Emission

Notice

This equipment has been tested using double shielded cables and terminators for EMI compliance. The use of unshielded cables, terminators, or modifications requires system testing for EMI testing for compliance to the standard.

Industry CanadaIndustrie Canada

This Class A digital apparatus meets all requirements of the Canadian Interference-causing Equipment regulations.
Cet appareil numérique de la classe A respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

FCC Notice

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at their own expense.

DECLARATION OF CONFORMITY

We, **Overland Data (Europe) Ltd.**
Unit3, Asheville Way
Wokingham, Berkshire
RG41 2PL England, United Kingdom

on our own responsibility, declare that the product:

Kind of equipment: **Cartridge Tape Drive**

Type designation: **Model DLT-LXBS, DLT-LXBD**

is in compliance with the following norms and documents:

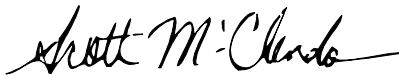
**European Council Directive 89/336/EEC laws relating to
electromagnetic compatibility. (EMC Directive)**

**EN 55 022, Radio Frequency Interference limits and measurement,
Information Technology Equipment, class B, standard.**

**EN 50 082-1, Electromagnetic compatibility, generic immunity
standard.**

European Council Low Voltage Directive 73/23/EEC
EN 60 950, Information Technology Equipment Safety Standard.

Accredited test laboratory: **TUV Product Service**
10040 Mesa Rim Drive
San Diego, CA 92121, USA



Scott McClendon, President
Manufacturer/Authorized
representative, name and
signature.

7 August 1998

Overland Data Inc.
8975 Balboa Ave.
San Diego, 92123, USA
place and date of issue

Japanese Voluntary Control Council for Interference (VCCI)

この装置は、情報処理装置等電波障害自主規制協議会（V C C I）の基準に基づくクラス A 情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

Translation: This is a Class A product based on the standard of the Voluntary Control Council for Interference by Information Technology Equipment (VCCI). If this equipment is used in a domestic environment, radio disturbance may arise. When such trouble occurs, the user may be required to take corrective actions.

Appendix B - Accessories/Spares/ FRUs

Spares and FRUs sorted by part number

Note: Part descriptions marked with an asterisk (*) indicate items that must be installed by trained service personnel.

Description	P/N
Add-on/Replacement Drive-LXB 2000XT-SE*	106036-001
Add-on/Replacement Drive-LXB 4000-Diff*	106037-002
Add-on/Replacement Drive-LXB 4000-SE*	106037-001
Add-on/Replacement Drive-LXB 7000-Diff*	106040-002
Add-on/Replacement Drive-LXB 7000-SE*	106040-001
Add-on/Replacement Drive-LXB 2000XT-Diff*	106036-002
Bar Code Reader Assembly*	106030-001
Conversion Kit, 4000 to 7000 - Diff*	106043-002
Conversion Kit, 4000 to 7000 - SE*	106043-001
Conversion Kit, Desktop to Rackmount	106028-001
Conversion kit, Rackmount to Desktop	106029-001
Magazine, 10 Cartridge	106035-001
Manual, LXB Installation/User	104126-101
Terminator, Diff SCSI - DLT4000	972492-002
Terminator, Diff SCSI (Wide) - DLT7000	106019-002
Terminator, S/E SCSI (Active) - DLT4000	972492-003
Terminator, S/E SCSI (Wide) - DLT7000	106019-001

Appendix B - Accessories/Spares/FRUs

Spares and FRUs sorted by part number

Note: Part descriptions marked with an asterisk (*) indicate items that must be installed by trained service personnel.

P/N	Description
104126-101	Manual, LXB Installation/User
106019-001	Terminator, S/E SCSI (Wide) - DLT7000
106019-002	Terminator, Diff SCSI (Wide) - DLT7000
106028-001	Conversion kit, Desktop to Rackmount
106029-001	Conversion kit, Rackmount to Desktop
106030-001	Bar Code Reader Assembly*
106035-001	Magazine, 10 Cartridge
106036-001	Add-on/Replacement Drive-LXB 2000XT-SE*
106036-002	Add-on/Replacement Drive-LXB 2000XT-Diff*
106037-001	Add-on/Replacement Drive-LXB 4000-SE*
106037-002	Add-on/Replacement Drive-LXB 4000-Diff*
106040-001	Add-on/Replacement Drive-LXB 7000-SE*
106040-002	Add-on/Replacement Drive-LXB 7000-Diff*
106043-001	Conversion Kit, 4000 to 7000 - SE*
106043-002	Conversion Kit, 4000 to 7000 - Diff*
108154-001	Levers, Door Replacement (10-pack)
972492-002	Terminator, Diff SCSI - DLT4000
972492-003	Terminator, S/E SCSI (Active) - DLT4000